ENVIRONMENTAL STATEMENT

PROPOSAL FOR MIXED WOODLAND

CARRICK ESTATE

ARGYLL

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PREFACE

This Environmental Statement has been prepared to inform a proposal for the establishment of mixed woodland on Carrick Estate some 6km to the south of Lochgoilhead.

The Environmental Statement includes a Non-Technical Summary (NTS) which provides an "executive summary" of the statement and its findings and which is presented in a non-technical manner. This Environmental Statement comprises the following documents:

- Non-Technical Summary
- The Environmental Statement

In addition to these, the Environmental Statement is supported by the following Technical Annexes which contain detailed technical information which has informed the findings presented in the ES:

- Technical Annex A: Archaeological Walk-Over Survey
- Technical Annex B: Landscape and Visual Analysis
- Technical Annex C: Ecological Evaluation
- Technical Annex D: Habitat Survey
- Technical Annex E: Ecological Site Classification
- Technical Annex F: Breeding Bird Survey
- Technical Annex G: Deer Management

- Technical Annex H: Analysis of Critical Load Exceedance
- Technical Annex I: Protected Species Surveys
- Technical Annex J: Confidential Golden Eagle Chapter
- Technical Annex K: Proposed Pier Facility

The Environmental Statement may be viewed at the following locations during the statutory consultation period:

Lochgoilhead Village Hall
Hall Road,
Lochgoilhead
Cairndow, Argyll, PA24 8AE
Phone: 01301 703559

Argyll and Bute Council
Kilmory
Lochgilphead
Argyll
PA31 8RT
Phone01546 602127

Loch Lomond & The Trossachs National Park Headquarters
Carrochan
Carrochan Road
Balloch
G83 8EG

Further copies of the Environmental Statement are available for £200 per hard copy or £10 for CD-ROM from:

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NON-TECHNICAL SUMMARY

This Environmental Statement (ES) covers the potential impacts arising from a proposal to establish mixed woodland over a gross area of circa 1526 hectares of former open hill grazings and inbye on Carrick Estate, near Lochgoilhead, (NGR NS180950).

The following Non-Technical Summary gives brief findings from the Carrick Environmental Statement 2012

The land on which this proposed woodland is to be planted has been acquired by a new owner who is considering the option to afforest the land as opposed to farming it given the very difficult economic climate for upland sheep farming (5 bids were made for the estate all associated with the proposal to afforest the property). This would require resources which are not justified in terms of current and likely future agricultural circumstances. The Loch Lomond and The Trossachs National Park Local Plan recognises that “agriculture is changing rapidly and many remaining in this sector rely increasingly on non-agricultural income sources. This has the potential to lead to major changes in landscape character and vegetation cover as grazing levels reduce and the risk of abandonment of farm units increases”.

Carrick falls within an area that is defined, in agricultural terms, as being "severely disadvantaged". The site is composed of a range of upland vegetation types including extensive areas of acid grassland (587.9 hectares or 38.5%), marshy grassland (400.5 ha/26.2%), upland heath (269.8ha/17.7%), blanket bog (128.7/8.4%) and semi-natural woodland (63/4.1%). Other incidental habitats include 48.8 hectares of bracken and 9.9 hectares of improved grassland. All of the habitats recorded at Carrick are common in an upland fringe setting and all have been modified by long-term grazing impacts.

Within the total area of 1526 hectares, 555.9 hectares (or 36.4% of the gross area) is proposed for woodland development to add to 63 hectares of existing broadleaves with open ground amounting to 907.1 hectares being retained. Open ground will be planned to help safeguard areas of ecological and archaeological value, to protect water resources, to provide for internal and external landscape design and to accommodate deer management.

The Environmental Statement has been informed by a number of surveys including National Vegetation Classification Survey, breeding bird survey, protected species survey, landscape and visual assessments and an archaeological walk-over survey. A wide ranging consultation process took place. This included the formal Screening Meeting of

29th June 2011. As the proposals developed, consultation continued thereafter with RSPB, SNH, Loch Lomond and The Trossachs National Park and the local community.

The Screening Meeting, chaired by Forestry Commission Scotland, described the outline proposals and provided the opportunity for comment and feedback. Following on from this meeting, all attendees and those who were unable to be present, were invited to make further comment and these were incorporated into the formal Screening Report which provided the direction for the Environmental Statement.

The overall objective of the ES is to:

- Identify the main, or significant, environmental issues relating to the proposed woodland development.

- Identify the nature and scale of the environmental effects that are likely to result from the establishment of mixed woodland.

- Identify areas where adverse impacts are minimised and positive impacts maximised.

The primary aims of the scheme are:

- To establish multi-purpose mixed woodland on previously grazed hill land for wood and fuel production and to help underpin a sustainable forest products industry, as an alternative to upland sheep farming.

- To enhance the landscape and maintain and extend the existing areas of semi-natural woodland.

- To provide community benefits through new opportunities for responsible public access and recreation.

- To create a carbon sink and improve Scotland's greenhouse gas balance.

The above to be achieved without compromising the core area of a resident pair of Golden Eagle.

The area statement below is based on the total area of the proposal which is 1526 hectares.

Carrick: Area Statement

TOTAL PROJECT AREA	1526Ha	100%
EXISTING WOODS – SEMI-NATURAL	62.84	4.1
SITKA SPRUCE	450.51	29.7
OTHER CONIFERS (Douglas Fir, Scots Pine)	22.3	1.4
MIXED NATIVE BROADLEAVES	33.9	2.2
LOW DENSITY BROADLEAVES	47.4	3.1
OPEN GROUND – UNPLANTED	909	59.5

Following the Screening Meeting, and subsequent meetings, the main issues, or sensitivities, were identified. These are:

- potential impacts of the project on archaeological remains, particularly those relating to sites of regional and local archaeological importance;

- potential landscape impacts of the project, particularly those relating to development of woodland and scrub over time and forest road construction;

- potential impacts on the ecology of the site, particularly those relating to the loss of open ground habitats and associated impacts on the breeding bird assemblage;

- potential impacts of afforestation on the acidity of receiving waters where the site lies within a critical load exceedance square where critical loads for total acidity for fresh waters are exceeded;

- potential impacts of future transport of timber and timber products from the forest;

Other issues are the potential impact(s) of the project on the local deer population and public access.

This Environmental Statement, requested by Forestry Commission Scotland, addresses the above issues and submits the following conclusions:

Archaeological impacts.

There is a need for any new large-scale forest proposals to identify and acknowledge the importance of cultural remains by maintaining patterns of open space which allow the historic and ancient landscapes to be interpreted.

To reflect this requirement, a cultural heritage assessment was commissioned to inform the ES. This included a desk-based study and reconnaissance field survey in early March 2012 covering the whole of the proposed development area. Up-to-date information was obtained on the locations of cultural heritage sites with statutory protection and non-statutory designations both within the proposed development area and within 2km of the proposed development boundary.

There are no Scheduled Ancient Monuments within the project area. However, the appraisal identified several archaeological and cultural heritage sites within the proposed woodland development area including cairns, enclosures, sheilings and rig and furrow. These are all of local archaeological importance.

Mitigation measures to avoid, reduce and offset the likely effects of the proposed development on significant cultural remains will be agreed with West of Scotland Archaeological Service (WOSAS) based on the cultural heritage survey and assessment. Mitigation measures include the mapping of all significant remains and the creation of buffer zones to protect these sites from inadvertent damage or loss.

Any new sites found during operational works will be reported to WOSAS and a view taken as to their significance and any necessary management requirements.

The impacts on the archaeological interest of the site arising from the project are judged to be neutral and not significant.

Landscape impacts.

The Landscape and Visual Impact Assessment for the proposed development assessed the predicted impact of the new woodland on the character of the landscape using a series

of accompanying photographs. These illustrate the main character zones within the estate and the design implications for introducing new woodland.

Carrick Farm is situated within the Loch Lomond and The Trossachs National Park and is therefore considered to lie in a scenically sensitive location. Carrick is situated in the “Steep Ridgeland and Mountains Landscape Character Area” of Argyll and the Firth of Clyde. The key characteristics are “dramatic mountain ridges with steep, plummeting slopes and rocky outcrops”.

The Landscape Assessment of Argyll and the Firth of Clyde (ERA, 1996) recognises that the “predominant force for change is commercial forestry. The plantations help to provide a sense of scale in this dramatic mountain landscape, but it is essential that the edges of the plantations respond to the landform in this sensitive and scenic landscape”.

Opportunities to accommodate further afforestation are noted within the Argyll and the Firth of Clyde Landscape Assessment as “long as they are well-integrated with the surrounding

landform" with particular emphasis on ensuring that "there is a gradual, natural transition, with a high proportion of broadleaved trees".

The commissioned Landscape Assessment for the proposed development examines the predicted impact of the new woodland on the character of the landscape. Viewpoints, as agreed with consultees, were selected at locations from which the proposed woodland development is likely to be visible. These were selected to represent different types of views from the local surrounding landscape.

The main factor that will have an impact on the landscape is the establishment of woodland and scrub. The development of woodland has been critically appraised from several local viewpoints, using annotated computer generated illustrations, approximately 20 to 25 years after planting, to help inform how any potentially adverse landscape impacts might be mitigated. The construction of forest roads will also affect the landscape as permanent features but have been located to reduce visual impact which will diminish as the trees become established.

The proposed development of Carrick Farm will gradually change an open farmed estate to a mixed woodland estate. The Landscape Assessment has been used to influence the shape of external and species boundaries to reflect the broad topography of the area.

Within these boundaries the planting design plan specifies areas of open space to further diversify the external woodland edge and respond to the smaller scale landform pattern. A key consideration has been integrating the proposal with FCs long-term forest plans to the north and south of Carrick.

The proposed woodland, designed to conform to current landscape guidelines, will impact positively on the landscape by providing structural and textural diversity to a landscape largely denuded of woodland cover by long-term grazing impacts.

The overall landscape impact of this project is judged to be long-term, beneficial, irreversible and significant.

Ecological impacts

The main ecological impact of the proposed scheme is the loss of open ground habitats to mixed woodland habitat with concomitant effects on species that require open ground for all, or part of, their life cycle.

Habitats

The proposed project has been subject to a full habitat survey and ecological assessment. Existing information and field work were used to evaluate the current, or baseline, ecological value and assess the potential impacts of planting mixed woodland.

The proposed woodland development area does not fall within, or near to, any statutory nature conservation designations.

The area has historically been managed as extensive hill grazing land. The dominant vegetation type, occupying some 38% of the area (588 ha) is species-poor acid grassland much of which has been derived from wet heath as a result of long-term grazing impacts.

Marshy, or wet, grassland is also extensive across the site covering 26% (400 ha) and includes purple moor-grass and rush dominated pastures. Again, these are species-poor as a result of modification by “long sustained sheep grazing” (Central Environmental Surveys). Some of the rush-pastures can be locally base-influenced and therefore more species-rich.

Upland heath at 18% or 270 hectares of the project area is mainly composed of wet heath

and is closely associated with, and grades into, blanket mire the latter covering 8.4% or 129 hectares of the project area. Other vegetation types include semi-natural broadleaf woodland (58 ha), bracken (48.8 ha) and small areas of improved in-bye grassland (10 ha).

Acid grassland, wet grassland, upland heath and blanket bog are priority habitats within the UK Biodiversity Action Plan. The extent of these habitats within a Loch Lomond and The Trossachs context has not been quantified within the Local Biodiversity Action Plan so it is difficult to fully assess the impact of this project on these habitats at a regional scale so the

potential impacts are discussed within a Carrick Farm context.

Acid grassland is one of the most widespread and common habitat in the uplands – most having been derived from the ecological over-grazing of dwarf shrub-heath. It has been estimated that within this proposal some 131 hectares will be subject to afforestation leaving a residual area of 457 hectares. The ecological significance of this change is considered to be low on account of the widespread nature of this habitat and the low ecological value of the Carrick examples.

Wet grassland is a more limited habitat within the uplands compared to acid grassland or upland heath with an estimated 212 hectares potentially subject to afforestation at Carrick leaving a residual area of 188 hectares. The ecological significance of afforestation on this habitat is therefore considered to be significant at the regional scale on account of its more limited extent and the higher species richness compared to acid grassland.

Upland heath is an extensive and widespread habitat in the uplands. At Carrick, 83 hectares will be subject to afforestation leaving a residual area of 187 hectares.

There is some 129 hectares of blanket bog occur on the site. All areas of blanket peat will be retained as open ground habitat.

There are 63 hectares of semi-natural upland birch/oak woodland on the site. All such areas will be managed to maintain and enhance their nature conservation value through a programme of expansion by natural regeneration and planting to enhance the semi-natural woodland habitat network.

The planting plan will ensure that 60% of the site will remain as open ground resulting in the retention of the current range of vegetation types at Carrick.

The impact of this project on the open ground habitats is deemed to have a medium magnitude impact. For acid grasslands this is deemed to be significant at the local scale and for wet grassland and upland heath at the regional scale over the medium

to long-term.

Birds

The project area has been subject to a breeding bird survey to help forewarn of potentially negative impacts which afforestation might have on species of bird presently occupying open hill ground. This revealed that a number of species of conservation concern use the site for part of their life cycle.

The commissioned breeding bird survey shows Carrick to be of low nature conservation value for its breeding bird assemblage except for a breeding pair of Golden Eagle for which a separate confidential report has been produced. A total of 13 species were recorded during the breeding bird surveys, of which 7 could be regarded as species requiring open hill ground as a habitat resource: Buzzard, Golden Eagle, Hooded Crow, Raven, Skylark, Snipe and Wheatear.

Of the three latter species, Skylark is a species of high conservation concern within the UK being a UK Biodiversity Action Plan priority species. However, in Scotland its numbers are increasing. Establishing a mixed woodland scheme is predicted to result in displacement of one pair of Skylark, one Snipe and two Wheatear due to the loss of open ground habitat.

The impact of this project on birds requiring open ground habitats is considered to be negative, irreversible but not significant on account of the poor breeding bird assemblage at Carrick and the retention of 62% open ground habitat.

Ecology – other protected species

The site was subject to a survey of otter activity which indicated no evidence of the use of water courses within Carrick by Otter or Water Vole. The watercourses are mainly small and fast flowing. Their riparian zones will be managed as a mix of open space and native broadleaves. This will improve the medium to longer-term habitat quality and thus provide enhanced shelter, breeding and feeding opportunities for otters.

The impact on otter arising from the project is judged to be neutral but with the potential to have medium to long-term benefits

Acidification and Hydrology

Forest canopies can significantly increase pollutant capture, through the "scavenging effect", leading to the acidification of upland soils and surface waters. This is particularly pertinent in areas like Argyll where the buffering capacity of the soils and underlying geology is poor. For this reason, Carrick lies within a critical load exceedance square as defined and mapped in Forest and Water Guidelines (Version 3).

In such areas it is normal practice to undertake a Critical Load Assessment as recommended in Forests and Water which has now superseded the Forests and Water Guidelines. This states: "where new planting is proposed within the catchments of water bodies at risk of acidification, an assessment of the contribution of forestry to acidification and the recovery process should be carried out; details of the assessment procedure should be agreed with the water regulatory authority."

The matter was discussed with the Scottish Environment Protection Agency (SEPA) who looked at the proposed scheme's location on their GIS Water Framework Directive (WFD) classification layer, and noted that there are no water bodies in that area which are classed as failing or at risk of failing good status. They also confirmed that they have no evidence that acidification is, or ever has been, an issue in the Carrick area and therefore the catchment is not at risk from acidification as a result of new woodland establishment.

SEPA's advice, with respect to the proposed woodland planting scheme at Carrick Farm, would be that there is no requirement for a Critical Load Assessment. On these matters, the final decision rests with the Forestry Commission (FC). They confirmed that they agree with SEPAs recommendation.

Water quality can also be adversely affected by ground preparation, forest road construction and chemical use if best practice guidance is not applied. The proposed methods of woodland establishment including mounding, screefing and shallow ploughing will have

minimal effects on soils and water. For example, continuous mounding disturbs in the region of 15-20% of the ground surface and because there are no continuous breaks in the soil profile will result in minimal disturbance to the rate of water run-off. All riparian zones within the project area will have defined buffer zones where no ground preparation

or chemical use will occur. This includes sensitive treatment of all water courses emanating from Carrick. A method statement for ground preparation will be discussed and agreed with FCS and SEPA.

Water quantity may also be affected by woodland establishment though the Local Forestry and Woodland Framework notes that "this is not a major issue in Argyll at present due to high levels of rainfall". Ultimately the proposed new woodland will dampen extreme variations in water run-off and the creation of semi-natural riparian woodland will boost biological productivity of water courses.

No detectable changes to acidification are anticipated. The impacts on water quality and quantity arising from the project are judged to be neutral in the short-term but beneficial and significant over the medium to long-term.

Social and economic impacts – employment

A comparison of rural employment has been made between the current agricultural baseline and the proposed change to woodland. The result of the proposals, in terms of rural employment, is predicted to be positive in relation to the agricultural baseline situation.

Overall, a comparison of the baseline agriculture employment with the forestry option shows that a net employment gain can be anticipated by the proposed land use change. With an assumed average rotation length (length of time from planting to felling) of 35 years for the first conifer crop at Carrick (ranging from 30 to 40 years in practise) it is predicted that project implementation will result in 3.5 average man years over 45 years. The baseline agricultural equivalent is 1.2.

Overall, the impact of this project in relation to rural employment is deemed to be

positive in the short, medium and long-term and significant.

Timber haulage

At the Screening Meeting held on the 29th June 2011, timber haulage was a major issue for the community.

Access to the proposed woodland development at Carrick is gained from the A83 and then either the B839 (Consultation Route) or B828 (Severely Restricted). From Lochgoilhead to

Carrick the C6, a minor public road, is Severely Restricted. This means it should not normally be used for timber transport in its current condition. Such routes are considered as being close to Excluded Routes and consultation with the local authority is required to achieve an agreed management regime to avoid land locking timber.

The proposed establishment of new commercial woodland at Carrick extends to circa 450 hectares of productive conifer and should come into production around 2047 yielding approximately 9,900 tonnes of timber per year on average over a 15 to 20 year period. This is equivalent to about 8 lorry loads of timber per week over 50 weeks. In reality this is more likely to be 4 loads of timber per day 5 days per week for about 20 weeks of the year.
Currently, Forestry Commission Scotland has existing in-forest road networks and planned forest roads which will come within a few hundred metres of the Carrick boundary. As well as providing timber from Carrick with a potential route to the A83 at the Rest & Be Thankful, a link to the Forestry Commission woodlands to the north and south of Carrick could provide advantages and options to the Forestry Commission's management of their woodlands linking to possible sea transport at Carrick or linking to Ardentinny and potential sea transport at Sandbank.

FCS is due to submit their draft heads of terms to UPM Tilhill for timber haulage servitudes to the benefit of the Carrick proposed planting.

The owners of Carrick also own land on the foreshore of Lochgoil at Carrick Village which could be used as a transit point to store timber for onward sea transportation if a suitable pier facility was created. Such a development would be subject to planning permission.

Details of this proposal have been submitted to the National Park and support in principle is being sought.

Current proposals are for a temporary floating pier to be brought to site when harvesting activity is underway. A rock causeway would be built to facilitate sea haulage using the floating pier system, with an area set-aside for timber stacking. Technical investigations showed that this site was suitable and this would allow the construction of a floating pier with a secure and stable loading platform with a constant freeboard height. Given the depth of water, it is anticipated that vessels with up to a 3,000 tonne capacity could be safely loaded.

The estimated stacking space at the proposed loading site is around 1,000 tonnes. When a boat arrives it is loaded by crane from this stock. At the same time, timber wagons or forwarders would bring in the rest of the timber direct from the forest. A 1,500 tonne vessel (e.g. for export to Ireland) would take one day to load (say 12 hours). 1,000 tonnes would be from the stock-pile, with the balance (500 tonnes) from timber wagons/forwarders direct from the forest.

UPM Tilhill already successfully use marine transport to ship timber to markets in the UK, Ireland, Scandinavia, and mainland Europe from a number of existing piers such as Sandbank and Ardrishaig. Currently a very similar floating pier development to the one proposed for Carrick is being created at Pennyghael on the Ross of Mull, with Scottish Timber Transport Scheme assistance, to take timber away from the fragile rural roads on the Island and away from having to use existing ferries and existing limited pier facilities in the north of the Island. The pier facility will also be offered to FC to further reduce the need to use the fragile public round system in and around Carrick

The impact of timber haulage on the infrastructure of the C6 is likely to be adverse without (a) development of in-forest haul routes and (b) creation of a pier to facilitate timber transport by sea. Impacts of timber haulage on the local community relate to increased timber traffic can only be mitigated by implementation of (a) or (b) or a combination thereof. Once implemented there will be no measurable adverse impacts

on the road infrastructure or the local community and there are likely to be additional public benefits through improved public access and potential substitution of road haulage of timber for sea transportation.

Other issues:

Deer management impacts.
Deer pose a serious threat to tree establishment and the management of deer numbers requires careful consideration. In view of this a deer fence is proposed for the whole legal boundary of Carrick Farm. Within this, and in consultation with surrounding landowners, a deer cull will be implemented to allow the proposed wood to establish. This will amount to 16 Red deer and 5 Roe deer.

The exclusion of grazing animals from the site in the short-term will also have the benefit of allowing restoration of open ground habitats such as upland heath and self-seeding of

semi-natural broadleaves. In the longer-term, when the woodland has been established and beyond browsing damage, deer will use the property and thus help maintain the remaining open ground mosaic of acid, wetland grassland and heathland communities.

Public access will be accommodated at strategic points within the deer fence and as informed by consultation with the local community and the National Park Authority Access Officer.

The impact of deer management, as proposed, arising from the project is judged to be short to medium-term, beneficial, reversible and significant in nature.

Public access impacts
A project of this nature can result, if poorly planned, in the loss of, or impeded, public access as a result of deer fencing and establishment of closed canopy woodland. Further, viewpoints from the site can be lost as a result of woodland establishment.

Within the National Park Local Plan, Carrick is defined as an area of moderate activity, with some growth potential around the shoreline/coastal strip to an area of low activity on the hill land above to be retained for quiet enjoyment.

There are no alleged or claimed rights of way within the project area. The nearest Core Path is the Carrick Castle to Ardentinny path which lies just outside of the eastern boundary of Carrick Farm.

The core path information, and evidence of public access routes across Carrick Farm, is a material consideration in the development of the woodland development proposals. The change of ownership and direction of land management has created an opportunity to encourage responsible public access along existing defined routes and as a result of track creation.

On this basis, the known routes currently used for pedestrian access have formed part of the iterative design process. The access route with the most potential for impact is along the Carrick Glen. Here the existing broadleaves will be reinforced by planting of semi-natural woodland which, amongst other benefits, will improve the visitor experience. Additionally, the unclassified road between shore and the eastern edge of Carrick Farm is an important public access route and therefore of high amenity value. This too is fully

recognised in the design of the woodland along this corridor which will incorporate native broadleaves and open space.

Further, there is scope within the proposal to introduce new formal access opportunities, where none currently exist, within the planted area utilizing the new forest track system.

With regard the potential impact of loss of viewpoints from within Carrick Farm it should be noted that the altitudinal planting limit is circa 450 metres OD. This will ensure that the hill tops remain open both as areas of public resort and maintenance of views across Loch Goil and beyond.

Deer fencing of the perimeter of the property has the potential to impede public access.

Styles and gates will be incorporated into the fencing design following consultation and agreement with the local community and the National Park Access Officer.

Overall there is no anticipated loss of public access to estate or surrounding hills, no loss of views from hill tops and with enhanced access opportunities resulting from track creation. To fully realize the benefits of the latter further consultation with the local community and the National Park Authority Access Officer is required.

The impact of this project on public access is deemed to be positive and significant at the local scale.

1. INTRODUCTION

1.1 Carrick Farm was purchased by the current owner in 2011. This change of ownership represents a potential change of direction with regard to the future management of the Estate. The new owner proposes to establish mixed woodland on a gross area of 1526 hectares of open hill ground. The primary aims are to:

- Establish multi-purpose mixed woodland on previously grazed hill land for wood and fuel production and to help underpin a sustainable forest products industry, as an alternative to upland sheep farming.

- Enhance the landscape and maintain and extend the existing areas of semi-natural woodland.

- Provide community benefits through new opportunities for responsible public access and recreation.

- Create a carbon sink and improve Scotland's greenhouse gas balance.

1.2 A Screening Meeting was held on the 29th June 2011 at Lochgoilhead Village Hall where the proposal to develop a mixed woodland estate was presented to statutory consultees and the local community (see Other Annexes/Screening Meeting/Screening Meeting Report). Following this meeting, Forestry Commission Scotland (FCS) requested in their letter dated 14th September 2011 (see Other Annexes/Screening Meeting/FCS Determination Letter) that an Environmental Statement (ES) be prepared to assist the process of Environmental Assessment (EA), in accordance with Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 and from this the key issues to be addressed were identified:

- potential impacts of the project on archaeological remains, particularly those relating to sites of regional and local archaeological importance;

- potential landscape impacts of the project, particularly those impacts relating to development of woodland and scrub over time and forest road construction;

- potential impacts on the ecology of the site, particularly those relating to the loss of open ground habitats and associated impacts on breeding birds and protected species populations;

- potential impacts of afforestation on the acidity of receiving waters where the site lies within a critical load exceedance square where critical loads for total acidity for fresh waters are exceeded;

- potential socio-economic impacts of the project on the local community particularly potential impacts of future transport of timber and timber products.

Other issues that arose during the Screening Meeting, or in subsequent discussions, were the potential impact(s) of the project on public access and deer populations.

Following the Screening Meeting other meetings were convened with the statutory consultees to take them through the development of the project and in particular the progress of the forest design to reflect the range of site sensitivities. A drop-in day for the local community was also organised and they were kept informed about the progress of the proposal by newsletter.

These meetings were as follows:

Table 1.1 Carrick Farm Meeting Schedule

Date	Attendees
1/12/11	FCS, NP

3/5/12	FCS
21/5/12	NP, SNH, RSPB
22/5/12	Public meeting at Lochgoilhead Village hall

The outcome of the Screening Meeting and subsequent Screening Report is summarised below:

Table 1.2: Screening Meeting Summary

Issue	Description of potential impact	Importance H/M/L	Comments
1. Archaeology	Potential for damage or loss of remains via site preparation and growth of trees.	Medium	Assess the need to accommodate the archaeological remains within the project proposals.
2. Landscape	Impact of woodland development over the medium to long-term.	High	Landscape and visual assessment required of proposed woodland development.
3. Ecology	Loss of open ground habitats and potential impacts on birds, and protected species.	High	Assess the impacts on vegetation communities; breeding bird assemblage and protected species.
4. Hydrology	Acidification risk and impacts on water quality and quantity.	Medium	Site lies within critical load square – assess impact of afforestation on pH values.
5. Social and economic	Loss of farming employment	Medium	Assess impacts of scheme on the long-term employment trends.
6. Timber transport	Increased traffic movements as a result of harvesting operations	High	Assess impact of scheme on timber haulage in relation to baseline.
7. Deer management	Population reduction to ensure woodland establishment.	Low	Deer control to be agreed with neighbours and within the context of a Deer Management Plan.
8. Public access	Impact of woodland establishment on opportunities for responsible public access.	Low	Ensure responsible access within the context of the Scottish Access Code.

1.3 The ES seeks to identify and evaluate the key adverse and beneficial environmental impacts of this project. It will also illustrate how the woodland design and implementation of associated works will take these impacts into consideration seeking to mitigate adverse impacts and enhance those

deemed to be of a beneficial nature. Archaeological, landscape, and ecological issues has had a major influence on the final design of the proposed woodland compared to the original Concept Map (see Maps/Concept Map) presented at the Screening Meeting.

1.4 Consultations

This Environmental Statement has been prepared after consultation with Forestry Commission Scotland, Loch Lomond and The Trossachs National Park, West of Scotland Archaeological Service, Scottish Environment Protection Agency, Scottish Natural Heritage, Royal Society for the

Protection of Birds, Argyll Raptor Study Group, Argyll and Bute Council Roads Department, Forest Enterprise, Lochgoilhead Community Council, Argyll Timber Transport Group and surrounding neighbours. Consultation with these organisations, groups and individuals established the “scope” of the ES.

The information and views provided through these consultations have been incorporated, where appropriate, into the overall woodland development proposals for the site. Table 1.3 shows the Scoping Matrix for this project.

Table 1.3: Carrick Farm Screening Matrix

SCOPING MATRIX: CARRICK FARM	1. Cultural/Archaeology	2. Landscape & Visual	3. Ecology	4. Hydrology/acidification	5. Timber Transport	6. Employment	7. Deer Management	8. Public access
WOSAS	■							
Lochgoilhead Community Council		■		■	■	■		■
Scottish Natural Heritage		■	■				■	■
RSPB			■					
SEPA			■	■				
Argyll and Bute Council Roads					■			
Loch Lomond and Trossachs NP	■	■	■	■	■	■	■	■

1.5 Project Team

A project of this nature and scope necessitated a diverse range of experience and expertise. The main contributors are summarised below:

Table 1.4: Project Team

Area of expertise	Adviser
Archaeology	Edward Bailey
Landscape and Visual	Liz McIntosh
Ecology: habitats and vegetation	John Gallacher, Alan Booth
Ecology: Birds	Dr Jenny Owen, Leif Brag, David Anderson, Enda McLoughlin, Arthur French, Dr Paul Haworth
Ecology: Protected species	Dr Jenny Owen, Leif Brag, John Gallacher
Ecology: Ecological Site Classification	John Gallacher
Acidification and Hydrology	Dr Tom Nisbet, John Gallacher
Timber transport	Tim Liddon, Stephen Tong

Deer Management	Leif Brag
Public access	John Gallacher

During the formulation of this woodland development proposal, and the subsequent preparation of this ES, useful advice was provided by the Forestry Commission Scotland (FCS), Scottish Natural Heritage (SNH), the Royal Society for the Protection of Birds (RSPB) and the Loch Lomond and The Trossachs National Park. The ES gratefully acknowledges their contribution and advice.

1.6 The ES follows the format recommended in Preparing an Environmental Statement (FC 2001) and concentrates on the issues raised at pre Screening Meetings, the formal Screening Meeting of 29th June 2011 and in subsequent meetings and correspondence.

1.7 A summary of the assessment of the potential environmental effects, both positive and negative, arising from this project for the establishment of mixed woodland is given in Table 1.4. A full assessment of these effects is covered in Section 5.

2.0 ENVIRONMENTAL ASSESSMENT METHODOLOGY

2.1 Introduction

This section outlines the role of EIA and describes the approach adopted in preparing the Carrick Farm Environmental Statement.

2.2 The Role of Environmental Impact Assessment

The EIA process aims to ensure that the likely significant effects of new developments on the environment are fully considered and used to inform the decision-making process.

Systematic analysis and clear presentation of information in a form which enables the importance of predicted effects, and the scope of mitigating them, to be properly evaluated is the key to the EIA process.

Good practice suggests that the EIA process should be treated as an iterative process rather than a single post-design environmental appraisal. This ensures that the findings of the EIA can be used to inform the overall woodland design process and thus achieve a "best fit" within the environment. This approach was used for Carrick: where potentially significant effects have been identified, every effort has been made to incorporate appropriate mitigation measures within the evolving planting design. Taking full account of the various environmental constraints and opportunities has therefore allowed the proposals to be adapted accordingly and in close consultation with the key consultees including Forestry Commission Scotland, SNH, National Park and RSPB.

All developments however must, by their nature, have some impact on the environment, no matter how slight. Afforestation schemes are no different. Even following an extensive mitigation process of prevent, reduce and offset there must be a net environmental change, the residual impact.

The overall residual impact and the significance of this impact is what is used to judge whether the proposed development should proceed or not, i.e.

is a measure of the environmental cost against the benefit of the development.

2.3 Scope of the Environmental Impact Assessment

The ES for the planting proposals at Carrick Farm has been prepared in accordance with Schedule 4 (Part 11) of the EIA (Scotland) Regulations 1999, and includes the following information:

- a description of the physical characteristics of the whole development area and the land use requirements during the woodland establishment phase and subsequent site works;

- a description of the proposed planting scheme, comprising information about the site and the design, size and scale of the proposals;

- the data necessary to identify and assess the main effects which the proposed scheme is likely to have on the environment;

- a description of the likely significant effects, direct or indirect, on the environment of the scheme, explained by reference to its possible impact on the:

  - archaeological resource

  - landscape and visual amenity

  - ecological resource

  - potential for acidification of receiving waters and other potential impacts on water quality and quantity

- social and economic issues

- timber transport issues

- deer management

- public access

- where significant adverse effects are identified, with respect to any of the foregoing, a description of the measures envisaged in order to avoid, reduce or remedy these effects; and

- a summary in non-technical language of the information specified above.

3. SITE DESCRIPTION

3.1 **Location, Land Use, Planning Context and Local Woodland and Forestry Framework**.

3.1.1 Location

Carrick Farm lies some six kilometres to the south of Lochgoilhead. Map 1 (see Maps/Location Map) shows the location and boundaries of the proposed scheme.

3.1.2 Land use

The area has historically been managed as extensive hill sheep grazing land. The dominant vegetation type, occupying some 38.5% of the area (588 ha) is species-poor acid grassland of two main NVC types: U5a *Nardus stricta-Galium saxatile* grassland and U6 *Juncus squarrosus-Festuca ovina* grassland in damper areas. Much of this community has been derived from wet heath as a result of long-term grazing impacts.

Marshy grassland is also extensive across the site covering 26% (400 ha) and includes NVC types M25 *Molinia caerulea-Potentilla erecta* mire and M23 *Juncus acutiflorus-Galium palustre* mire. Again, both are species-poor as a result of modification by "long sustained sheep grazing" (Central Environmental Surveys). Some of the M23 can be locally base-influenced and therefore more species-rich with *Carum verticillatum, Dactylorhiza maculata, Caltha palustris* and *Filipendula ulmaria.*

Upland heath at 18% or 270 hectares of the project area is mainly composed of NVC M15 *Trichophorum cespitosum-Erica tetralix* wet heath. It is closely associated with, and grades into, blanket mire NVC M17 *Trichophorum cespitosum-Eriophorum vaginatum* mire the latter covering 8.4% or 129 hectares of the project area. Other vegetation types include semi-natural

woodland (63 ha), dense bracken (48.8 ha) and small areas of improved in-bye (10 ha).

There is no statutory or non-statutory nature conservation designations associated with Carrick Farm. There is however areas of semi-natural woodland thought to be of ancient semi-natural origin.

The site falls within the Loch Lomond and The Trossachs National Park. Carrick also falls with the Cowal-Argyll Forest Park Action Plan area of the Local Woodland and Forestry Framework 2003 this notes: "*woodland and forestry are a key component of local identity and culture. There are comparatively few opportunities for new woodland that would not affect remaining areas of farmland and significant hill habitats".*

3.1.3 Local and National Planning Context

The project area falls wholly within the Loch Lomond and The Trossachs National Park designated under the National Parks (Scotland) Act 2000 which sets out four statutory aims for National Parks in Scotland. These are:

- To conserve and enhance the natural and cultural heritage of the area,
- To promote sustainable use of the natural resources of the area,
- To promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public, and
- To promote sustainable economic and social development of the area's communities.

The scope of the Act's statutory aims also sets Scotland's National Parks apart from those of England and Wales, as it requires the promotion of sustainable use of natural resources, the sustainable economic and social development of local communities.

The relevant planning context is the National Park Plan 2007-2012 and the adopted Local Plan 2010-2015.

The guiding principle of the National Park Plan is to encourage the growth

and development of sustainable communities. In view of this, the National Park Plan has four aims:

- To support development of the local economy;
- To support urban and rural communities;
- To support and protect the natural and built environment; and
- To make the best use of services and facilities.

The Local Plan covers a number of themes and related policy issues as follows:

Archaeology

Any afforestation proposal within the National Park must ensure that it does not obscure cultural remains (National Park Plan). There is a presumption against development which would destroy or adversely affect the appearance, fabric or setting of Scheduled Ancient Monuments, sites of national importance and other areas of significant archaeological interest. The National Park Authority will require an appraisal of the impact of the proposed development on the cultural heritage of the site. In view of this, the site was

subject to a full walk-over archaeological survey (see Technical Annex A). No nationally designated areas or features of cultural heritage interest have been identified within the project area.

Policy ENV25 covers Scheduled Ancient Monuments whereby "development shall not be permitted which adversely affects scheduled monuments or their settings". **Policy ENV26** covers other unscheduled sites of archaeological importance whereby unscheduled archaeological heritage
will be expected to be retained, protected and preserved in situ in an appropriate setting.

Landscape

The inclusion of this area within a National Park reflects the high landscape value attributed to this part of Argyll and has been fully assessed as part of the Landscape Character Assessment process.

The nearest National Scenic Area is Loch Lomond some 14 kilometres to the east of Carrick.

Policy L1 of the Local Plan is designed to guide development to ensure valued landscapes are not lost, to conserve and enhance the special qualities of the Park's landscapes, to reinforce local distinctiveness and, where possible, to deliver enhancements to natural and historic landscapes.

The landscape of the National Park, which is one of the area's major assets, is sensitive to a range of development impacts. It is therefore important that landscape considerations are taken into account early in the design of new planting schemes. When assessing proposals which may have a significant effect on the landscape, the National Park Authority will take into account the

Objectives and Guidelines for Landscape Character (National Park Plan). This includes consideration of the forces of change such as tracks, obscuring viewpoints and ensuring that commercial plantations “enhance the contribution that commercial forests make to the quality of the Park’s landscape”. In view of this, this current proposal has been subject to a full landscape and visual appraisal (see Technical Annex B).

Nature conservation

The Local Plan notes that “environmental considerations should be integrated into the design of development at an early stage” while “ensuring biodiversity is protected and enhanced across the entire Park area”.

There are no statutory or non-statutory nature conservation designations affecting Carrick.

Polices ENV1 to ENV3 of the Local Plan refer to development within or affecting international, national or local sites for nature conservation such as

SACs, SSSI and sites of local nature conservation importance. No part of Carrick is designated at an international, national, regional or local level for nature conservation.

Policy ENV4 covers legally protected species under the Habitats Regulations (1994) or the Wildlife and Countryside Act 1981. “Where there is good reason to believe that a protected species may be present on a proposed development site, an ecological survey will be required to determine whether the species is present, the likely impacts on the species or habitat, and any mitigation and compensation measures that will be undertaken” (Local Plan). Carrick has been subject to a number of protected species surveys to ensure that this issue is taken fully into account during the development of the proposal and the various iterations of the proposed planting design. Indeed protected species were a major planting design consideration.

Policy ENV5 covers species and habitats identified in national actions plans. “Development that would have an adverse impact (including cumulative impact) on habitats or species identified in the UK Biodiversity Action Plan or on the Scottish Biodiversity List will only be permitted where:

- it is demonstrated that the need and justification for the development outweighs the local, national or international contribution of the area of habitat or populations of species;

- significant harm or disturbance to the ecological functions, continuity and integrity of the habitats or species populations is avoided, or minimised where harm is unavoidable, and appropriate compensatory and/or management measures are included either within or outside of the site; and

- the functions of woodlands, peat and bog lands for carbon sequestration will not be impaired in the medium to long term.

In view of the above policies full ecological surveys and appraisals have formed part of the Carrick EIA process (see Technical Annexes C, D, F, I

and J).

3.1.4 National Planning Policy and Advice

The most relevant to this project is **NPP14 Natural Heritage**. This gives guidance on how the Government's policies for the conservation and enhancement of Scotland's natural heritage should be reflected in land use planning. Natural heritage embraces the combination and interrelationship of landform, habitat, wildlife and landscape and their capacity to provide enjoyment and inspiration. It therefore encompasses both physical

attributes and aesthetic values and has important cultural and economic dimensions. The NPPG states:

"The protection of natural heritage may sometimes impose constraints on development. However, conservation and development can often be fully compatible and, with careful planning, the potential for conflict can be minimised".

3.1.5 Scottish Ministers have set a target of generating 50% of Scotland's electricity from renewable sources by 2020 (with an interim target of 31% by 2011). **Scottish Planning Policy SPP 6, 'Renewable Energy'**, sets out how the planning system should manage the process of encouraging, approving and implementing renewable energy proposals when preparing development plans and determining planning applications. Woodland development is a key component of Scotland's renewable energy approach (Woodfuel Taskforce).

3.1.6 Forestry and Woodlands

The National Park Local Plan fully recognises the importance of woodlands and trees for their **"**different values and uses including recreation, landscape, biodiversity, timber production and mitigating climate change. Issues associated with the management of woodlands and trees include conserving and restoring biodiversity, managing the spread of invasive species, recognising the contribution of forests and woodlands to the

landscape character and cultural history of the National Park, ensuring public access to and enjoyment of woodlands, and ensuring that forests and woodlands continue to contribute to the economy of the Park".

Policy ENV8 ensures that ancient, long-established and semi-natural woodlands are protected from inappropriate development.

Forestry planting and replanting proposals should take full account of landscape considerations including:

- respecting the inherent characteristics of the landscape character type, and local landscape character, in terms of location, scale, layout, tree species, and age composition of the proposal;

- enhancing existing forested landscapes through improvements in the design and fit of forests; and

- incorporating the advice and guidance contained in the Loch Lomond and The Trossachs Woodland and Forestry Framework (Argyll Area).

Within the Land Use and Natural Heritage section of the National Park Plan, **Policy BD1** seeks to enhance the biodiversity by protecting it from potentially damaging impacts, setting actions plans for habitats and species via the National Park Biodiversity Action Plan and by identifying, creating and enhancing habitat networks to ensure ecological connectivity. Of particular relevance to Carrick, is the proposed Forest Habitat Network which includes the lower slopes of the farm and the adjoining State forest properties to the north and south.

The Forestry Framework notes: restructuring and better management of existing woodland, together with woodland expansion should create forest habitat network links and improve the area's biodiversity". The key issues relating to forestry in the Cowal/Argyll Forest Park Action Area of the Framework identifies several key issues:

- Woodland and forestry are a key component of local identity and culture;

- There are comparatively few opportunities for new woodland establishment without impacting on remaining areas of farmland

and significant hill habitats;

- A significant proportion of the productive coniferous forests are uniform in age and species structure. As they near maturity there will be opportunities to enhance their visual and ecological diversity such as though restoration of important PAWS sites;

- There is considerable potential to increase the range of recreational opportunities;

- There will be considerable harvesting activity……it will be important to optimise economic benefits for local communities and to minimise adverse impacts on local communities and visitors.

The recommended approach and emphasis for Cowal/Argyll Forest Park fully recognises the importance of productive forestry in this area which will "remain a principal land" and that "recreation, landscape and nature conservation objectives will sit alongside the objective of timber production".

3.1.7 National Forestry Policy

An expansion of woodland area is one of the 40 UK Indicators of Sustainable Forestry.

The strategic vision for Scottish forestry is contained in the Scottish Forestry Strategy 2006. The Strategy has an aspiration to increase forest cover from 17.1% to around 25% of Scotland's land area by the second half of this century.

The Strategy identifies a number of woodland creation priorities for Scotland with the most relevant to Carrick being highlighted:

- **Helping to tackle greenhouse gas emissions**. (Carbon sequestration, timber and fuel production)

- **Restoring lost habitats and adapting to climate change.** (Forest habitat networks and new native woodlands).
- Helping to manage ecosystem services. (Sustainable flood management and protection of soil and water resources).
- **Underpinning a sustainable forest products industry.** (Consistent and reliable timber supply for timber processing and wood fuel investments).
- **Supporting rural development.** (Supporting rural businesses and farm diversification).
- **Providing community benefits.** (Provision of welcoming and well-managed woodlands in and around communities).
- Enhancing urban areas and improving landscapes.

Woodland expansion is a key objective of the Scottish Government to help meet strategic objectives, particularly in relation to counteracting climate change and to stimulate economic development.

Woodland is a significant carbon sink with woodland creation offering a practical and readily achievable way to improve Scotland's greenhouse gas balance. Woods also provide a sustainable source of near carbon-neutral raw materials.

The Scottish wood-chain now sustains 20,000 jobs and adds around £500M/yr to the Scottish economy (FC 2008 figures). Creation of new timber producing forests over the next ten years would have a significant positive impact in sustaining timber production and providing long-term confidence for continued investment in the timber processing and wood fuel sector.

Forestry development supports rural development especially in areas where land use options are limited. Forty-four percent of forestry and timber processing related businesses are rurally based, with 15% based in areas categorised as remote rural or very rural (Scottish Government Urban Rural Classification Maps). There is long-term potential to further increase the local economic contribution of forestry in remote rural areas.

3.2 Land Use Balance

"Reasonable balance" may be defined as the appropriate integration of the range of land uses in the area to ensure their ability to continue to develop sustainably. Perceptions of what is an "appropriate" balance may very between different interest groups. For the purposes of the Carrick proposal, land use balance has been considered within the Cowal/Argyll Forest Park Action Area of the Local Woodland and Forestry Framework. Figures abstracted from this indicate the following change in woodland cover at this level should this project be implemented:

Table 3.1: Current woodland cover within the Cowal/Argyll Forest Park Action Plan Area of the Local Woodland and Forestry Framework and the impact of Carrick being planted.

Area	Total area of forest cover (ha)	% commercial conifer	Proposed net area of Carrick planting	% increase within Forest Park
Cowal/Argyll Forest Park	13,500	80	554.1	4.1

Source: Local Woodland and Forestry Framework.

No significant new planting has taken place within this Action Plan Area since the production of the Local Woodland and Forestry Framework in 2002.

3.3 Geology, Soils and Land Capability for Agriculture and Forestry

The underlying geology at Carrick is predominantly drifts derived from arenaceous schists and strongly metamorphosed argillaceous schists of the Dalradian series.

Soil information, based on the Soil Survey of Scotland map for South West Scotland, categorises the prevailing soil types as part of the Strichen Association composed of a range of soils types including peaty podzols, peaty gleys and peat.

The MLURI Land Capability Classification for Agriculture confirms the land is

suited to rough grazings with low grazing values characterising the area. There are some small areas of improved grazings on the lower slopes (circa 10ha) where the land has been agriculturally improved.

The MLURI Land Capability Classification for Forestry indicates Carrick has limited flexibility for the growth and management of trees. Species choice is limited to conifers, such as spruces, larches and pines, and to birch, alder or other hardy broadleaves.

3.4 Topography

The site topography is typified by steeply rising hills from the loch shore at 40 metres OD to the highest hills of Beinn Bhreac, Cruach a' Bhuic and Sgurr a' Choinnich along the western march of the property between 600 and 650 metres OD.

3.5 Hydrology

The property falls within an exceedance square for acid deposition (Forest and Water Guidelines, 4th Edition). This issue was fully discussed with SEPA who, using their Water Framework Directive (WFD) classification layer, concluded that there are no water bodies within Carrick which are classed as failing or at risk of failing good status. They also confirmed that there is no evidence that acidification is, or ever has been an issue in this area.

SEPA's advice, with respect to the proposed woodland planting scheme at Carrick Farm, would be that there is no requirement for a critical load assessment. FC agreed with this assessment.

3.6 Vegetation

A full vegetation survey has been undertaken for this site and forms part of a separate report (see Technical Annex D).

Table 2.3 below is a summary of the main vegetation types found on the site and the percentage area they cover:

Table 3.2: Main vegetation types on Carrick Farm

PHASE I CODE	NVC TYPE	PHASE I HABITAT	AREA (Ha)	AREA %
A1.1.1	W4b (W17 W11b)	WOODLAND BROADLEAVED SEMI-NATURAL	63	4.1
A1.2.2	-	WOODLAND CONIFEROUS PLANTATION	0.7	0.04
B1.1	U5a, U6b, U6d	ACID GRASSLAND UNIMPROVED	587.9	38.8
B. 4	MG7, MG1	IMPROVED GRASSLAND	9.9	0.6
B.5	M6d, M25, (M23)	WET GRASSLAND	400.5	26.2
C.1.1/C.1.2	U20	BRACKEN CONTINUOUS/BRACKEN SCATTERED	48.8	3.2
D2	M15, H12a, (H18a, H21a)	DWARF SHRUB HEATH	269.8	17.6
E1.1	M17c	BLANKET BOG	128.7	8.4
I.1.1	-	INLAND CLIFF (ACIDIC)	0.2	0.01
TOTAL			1526	100

Source: Carrick Vegetation Survey, 2010

The site is composed of a range of upland vegetation types including extensive areas of acid grassland (587.9 hectares or 38.8%), marshy

grassland (400.5 ha/26.2%), upland heath (269.8ha/17.6%), blanket bog (128.7/8.4%) and semi-natural woodland (63/4.1%).

Other incidental habitats include 48.8 hectares of bracken and 9.9 hectares of improved grassland. All of the habitats recorded at Carrick are common in an upland fringe setting and all have been heavily modified by long-term grazing impacts.

Within this general pattern of vegetation at Carrick, there are several areas of interest as follows:

- Intact (active) blanket bog, typed as NVC M17 *Scirpus cespitosus-Eriophorum vaginatum* mire is a UK HAP priority habitat. This occurs to the south of Lochain nan Cnaimph and the headwaters of the Carrick Burn and the Allt Reinain. These areas have a good assemblage of species, a good *Sphagnum* layer and remain wet underfoot.

- Semi-natural woodland, typed as NVC W4 Wet Birchwood and NVC W17 Upland Oakwood, is a UK HAP priority habitat. It occurs above the loch shore and to the south of the site.

- Some of the wet grassland areas have localised base-flushing and are therefore more species-rich with whorled caraway (*Carum verticillatum*), heath spotted orchid (*Dactylorhiza maculata*), meadow sweet (*Filipendula ulmaria*) and marsh marigold (*Caltha palustris*).

3.7 **Fauna**

3.7.1 Birds

As part of the EIA process, a breeding bird survey (2011) was undertaken. The accompanying report is included in Technical Annex F. A separate report for Golden Eagle is part of a confidential Technical Annex J.

Breeding Birds 2011

A total of 48 man-hours were incurred in the preliminary site inspections

and the breeding bird survey using the Brown and Shepherd (1993) methodology. The results are summarized below:

Table 3.3: Target species recorded on Carrick during 2011 breeding bird survey

Species	Scientific name	Conservation Status[1]
Bullfinch	*Pyrrhula pyrrhula*	Amber List, UKBAP, SBL
Buzzard	*Buteo buteo*	Green List
Chaffinch	*Fringilla coelebs*	Green List
Common Crossbill	*Loxia curvirostra*	Green List
Common Gull	*Larus canus*	Amber List
Common Snipe	*Gallinago gallinago*	Amber List, SBL
Golden Eagle	*Aquila chrysaetos*	Amber List, Annex 1, Sch 1, SBL
Hooded crow	*Corvus cornix*	Green List
Raven	*Corvus corax*	Green List
Skylark	*Alauda arvensis*	Red List, UKBAP, SBL, LBAP
Tree pipit	*Anthus trivialis*	Red List, UKBAP
Wheatear	*Oenanthe oenanthe*	Amber List
Willow warbler	*Phylloscopus trochilus*	Amber List

1 Status:

- *Red = Species which are globally threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.*
- *Amber = Species that have an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localized populations.*
- *SBL = Scottish Biodiversity List*

Black grouse

Records from RSPB (Boles, pers comm) indicate that there are no black grouse records for Carrick. The closest known leks are Lochgoilhead – 4 cocks in 2011 (NN211013), and a single cock at Stronachullin (NS177877). Drimsynie Estate to the north and Stronachullin to the southwest are in SRDP for black grouse management – bracken control and grazing management mainly, with the small areas fenced off on Stronachullin to assist woodland establishment by natural regeneration.

Special effort was focused on locating black grouse present within Carrick. Surveys were undertaken on the 29th April 2012. No black grouse or signs of black grouse (feathers or droppings) were recorded.

Significant species

Using the data from the Breeding Bird Survey 2011, significant species are defined as those being most at risk from loss of open ground habitats. In this regard Golden Eagle, Skylark, Snipe and Wheatear which breed on the site, are considered to be the most vulnerable to loss and fragmentation of open ground habitats. The significance of these species in relation to their current conservation status is summarised below:

Table 3.4: Breeding bird species of significance within the project area.

Species	**Status**		**Significance in relation to project area** *H = High, M = Medium, L = Low*
	Red	**Amber**	
Golden eagle		✓	**H** (Annex 1 Habitat Regs 1994, Schedule 1 Wildlife and Countryside Act 1981, UK BAP, LBAP, Scottish Biodiversity List)
Skylark	✓		**H** (UK BAP, LBAP, Scottish Biodiversity List)
Snipe		✓	**L**
Wheatear		✓	**L**

Overall, the assemblage of birds requiring open ground habitat , excluding Golden Eagle which is subject to a separate confidential report, is very limited this being consistent with a habitat long modified by hill grazing. This

includes the high frequency of common species generally associated with sheep-walk, such as Hooded Crow.

Following the purchase of Carrick Farm, a pair of golden eagles was recorded

nesting on the property. The pair produced a chick in 2011 and 2012, neither of which survived. Starvation is likely to have been a factor, with results from surveys suggesting a lack of live prey or carrion on the property.

The original planting proposal of 873ha of mixed woodland has been reduced to 554ha (36% of the property). The current proposal has been designed to accommodate the eagle pair by retaining large areas open for hunting and by leaving important topographical features unplanted. The design incorporated results from the PAT model and over 97 hours of vantage point surveys conducted between December 2011 and July 2012. A key feature of the proposal is low-density native woodland planting designed to improve the live prey base and subsequent breeding success of the eagles.

With implementation of mitigation measures, 59% of the site will remain unplanted. It is anticipated that the time-lag to canopy closure of planted trees (10-15 years) will be sufficient for the live prey base to show signs of recovery. During these years, deer carrion will be provided to the eagle pair as part of a deer management strategy.

Long-term monitoring of the eagle pair and changes to the live prey base will be conducted. Funding will be made available for research into the impacts of afforestation upon golden eagles in Scotland.

3.7.2 Mammals

Red squirrel

Carrick contains some 63 hectares of semi-natural broadleaf woodland which might hold some potential for Red Squirrel. Importantly, Carrick lies adjacent to two Forest Enterprise properties which have been identified by SNH as Priority Woodland for Red Squirrel.

Expansion of woodland cover, including mixed conifer and broadleaf, would benefit the longer-term prospects of this species within an area identified as a

priority area.

Badger

Discussions with the previous owner and results from the protected species and other surveys indicate that there is no evidence of badger setts on this site.

Otter and Water vole

The site was subject to a focussed otter and water vole survey covering the proposed water crossing points as described in Technical Annex I. There is no evidence that Otters or Water Voles use the site.

Deer

Roe and red deer are present within and around the proposed woodland development area but numbers are generally low as the neighbouring plantations are all managed by FE. A programme of felling and restocking has necessitated a rigorous deer control policy. The issues surrounding deer at Carrick are fully covered under Technical Annex G.

3.8 **History of Land Use and Archaeology**

The project area was subject to a thorough archaeological archive search and walk-over survey (2012) which forms a separate report (see Technical Annex A).

There are no Scheduled Ancient Monuments within the project area, although one scheduled monument and three listed buildings lie adjacent to the site. Research and walk-over survey have identified a number of archaeological features in five areas of the proposed woodland development area.

The features are of local significance as they relate to early land use of the

region. These include cairns, rig and furrow, enclosures and sheilings.

Forests and Historic Environment (FC 2011) notes that “it is important that all significant heritage features, and not just designated ones, are protected and that consideration is given to the preservation and enhancement of cultural and historic landscapes”. All areas worthy of archaeological conservation as agreed with the West of Scotland Archaeological Service (WOSAS) will be buffered and protected from disturbance by proposed forestry operations. The access to, and the landscape context of, such sites will also be preserved and enhanced. This complies with the requirement of Forests and Historic Environment which states: “Steps should be taken to ensure that historic features, which may be adversely affected by forestry, are known and evaluated on an individual site basis, taking advice from the local historic environment services”.

3.9 **Landscape**

Carrick Farm is situated within the Loch Lomond and The Trossachs National Park and on the eastern edge of the Argyll Forest Park and is therefore subject to a number of policy considerations, aimed at encouraging the development of landscapes which reflect the aspirations of local people.

These include the Draft Plan for the National Park 2012-2017 which outlines policy in relation to landscape, the Local Forestry and Woodland Framework (2002) and the Landscape and Visual Assessment (LCA) for Argyll and the Firth of Clyde (1996). These reports were used to help inform the production of the Carrick Landscape and Visual Assessment (Technical Annex B). The LCA provides a detailed appraisal of landscape character and makes recommendations on the nature of planting which might be appropriate within specific landscape types.

Within the Landscape and Visual Assessment for Argyll and the Firth of Clyde the proposed scheme forms part of the 'Steep Ridgeland and Mountain' landscape type in the Cowal Ridges Landscape Character Area. This landscape character type is typified by dramatic mountain ridges with steep slopes and rocky outcrops. Conifer plantations occupy much of the

lower slopes with open moorland and rock outcrops above. Scattered

broadleaved woodland is also a characteristic, with birch woodland along burns and in patches on upper slopes and oak woodland on lower sheltered slopes. In relation to forestry, the LCA identifies the siting and design of forests in the landscape and threats to semi-natural habitats as key issues.

The vegetation associated with this landscape type is described elsewhere but is mainly upland acid grassland, upland heath with extensive areas of wet grassland.

The Landscape and Visual Assessment has been used to inform the shape of external boundaries to help reflect the broad topography of the area. Within these boundaries the planting design plan specifies areas of open space to further diversify the external woodland edge and respond to more small scale landform pattern. Areas of broadleaf stocking have also been incorporated to develop graded and varied margins and to reinforce existing areas of semi-natural woodland especially along Carrick Glen. The proposed development of a variably spaced native tree and scrub zones will provide both conservation and landscape benefits by softening visually intrusive edges and creating a transition zone for flora and fauna with particular reference to improving the live prey base for Golden Eagle.

Internally, areas of light stocking and open ground have been left relating to landform pattern and to archaeological and ecological features as noted in the relevant Technical Annexes. These areas of open ground have been given natural shape and graded margins. They create spatial variety within

the woodland, benefiting visual diversity and habitat provision (by increasing internal woodland edge).

Intimate small areas of open space and scattered trees will create a varied mosaic with more densely planted areas, creating continuous structural diversity that reflects modern design standards. Over time, there will be an increase (of 81ha) in broadleaved woodland, concentrated along the loch shore, Beannan Glen (Carrick Burn) and an extended treeline on the upper margins of the site to assist the development of a woodland habitat network

and ensuring linkage with the FE PAWS restoration sites at Knapp and Cormonachan.

4. DESCRIPTION OF THE PROPOSAL

The planting proposal map is appended to this ES (see Maps/Provisional Planting Design). The proposed development is summarised below. The objective is to establish mixed woodland incorporating extensive areas of open space. The area statement is as follows:

Table 4.1: Area statement

TOTAL PROJECT AREA	1526Ha	100%
EXISTING WOODS – SEMI-NATURAL	62.84	4.1
SITKA SPRUCE	450.51	29.7
OTHER CONIFERS (Douglas Fir, Scots Pine)	22.3	1.4
MIXED NATIVE BROADLEAVES	33.9	2.2
LOW DENSITY BROADLEAVES	47.4	3.1
OPEN GROUND – UNPLANTED	909	59.5

The proposal is planned to reflect best practice in woodland establishment and ensure a sympathetic response to archaeology, landform, hydrology and nature conservation values as identified in the relevant Technical Annexes.

The initial woodland design was developed to take into account the full range of site constraints known at that time and formed the basis of a business plan, which met the client's objectives.

This design is reflected in the Concept Map (see Maps/Concept Map) which was tabled at the Screening Meeting held at Lochgoilhead village hall on the 29th June 2011.

The original Concept Map significantly exceeded normal environmental standards in woodland design. For example, the proposed area of planting was over 40% native broadleaves, compared to the 5% minimum for new productive woodlands required within the UK Forest Standard.

However, the Concept Map was produced prior to site specific archaeological, landscape, ecological and other assessments. All site surveys have been used to inform the proposed final planting design (see

Maps/Provisional Planting Design). The iterative process to derive this proposed design has been fully discussed with SNH, RSPB and the National Park during the course of project development.

4.1 **Purpose of Development**

The new owner of Carrick Farm wishes to establish circa 554 hectares of mixed woodland over a gross area of 1526 hectares of former agricultural grazings. This represents some 36% of the whole estate. The aims of the project are summarised below:

- Establish multi-purpose mixed woodland on previously grazed hill land for wood and fuel production and to help underpin a sustainable forest products industry, as an alternative to upland sheep farming.

- Enhance the landscape and maintain and extend the existing areas of semi-natural woodland.

- Provide community benefits through new opportunities for responsible public access and recreation.

- Create a carbon sink and improve Scotland's greenhouse gas balance.

4.2 Land Use

The main historic land use has been the grazing of domestic stock. Agricultural improvement, to increase the carrying capacity of the land, has included drainage of the mire systems and pasture improvement along the shore to create areas of improved pasture.

4.3 Alternatives to the current proposal

The new owner recognises the inherent limitations of the natural resources of this site. He considers that the only alternative to the present proposal is to keep the land under open grazings in a very uncertain and difficult economic climate for upland sheep farming and within an area classified as agriculturally suited to rough grazings. The availability of inbye (easily accessed lower ground of good fertility) on Carrick Farm is severely limited with only ten hectares of improved inbye included within the ownership. While this might be extended, by purchasing additional land, it would require resources which he considers not to be justified in terms of current and likely future agricultural circumstances. Of the 5 parties interested in purchase of the estate, all were from the forestry sector.

4.4 Establishment Techniques

4.4.1 General

The perimeter of the property will be deer fenced to protect the growing trees from browsing and to ensure early and effective establishment.

The final line of the deer fence will be discussed and agreed with FCS, SNH and the National Park Authority to ensure potential adverse impacts on landscape, birds and public access are minimised through careful siting. The fence will be monitored for bird strike and marked if this is deemed to be necessary.

As the current proposal is for ring fencing the entire area with deer fencing a full Deer Management Plan, based on the SRDP template, is currently not considered necessary or beneficial in order to either achieve the objectives of woodland establishment, safeguard deer welfare or protect habitats outwith the deer fenced area. This is based on the fact that deer numbers in the area are generally low as the neighbouring forest plantations are all controlled by FCS's own ranger and the objective is to keep deer numbers low in order to establish their restock programme without detrimental deer damage.

Carrick Farm has not and does not carry a resident deer population. There has been some degree of usage by deer moving in and out of the adjacent FCS plantations. Carrick farm has never been a wintering ground for deer as the deer invariably seek shelter in the adjacent unfenced FCS woodlands.

Establishment will be assisted by mechanical mounding and where this is not possible, for technical reasons, hand screefing or hand-turfing will be employed. Shallow ploughing, in preference to mounding, will also be considered as a ground preparation technique but only where this meets with the agreement of FCS and current published guidelines. These works provide suitable planting positions and ensure good early establishment and growth.

Care will be taken to protect water quality with strict adherence to Forests and Water (FC 2011). All proposed water crossings will comply with the Water Framework Directive, General Binding Rules and the need for SEPA consultation, registration and licenses as appropriate.

All the riparian zones will be managed as a mixture of open ground and/or semi-natural broadleaves according to site type. No ground preparation will take place within 20 metres of the main water courses and for smaller watercourses buffer zones will be maintained in accordance with Forests and Water.

Ground rock phosphate will be applied, if necessary, at 150 grams per tree to aid conifer establishment but this will be outwith the buffer zones defined above. This will only be undertaken after full consultation with SEPA.

Chemical weeding will be carried out if considered necessary to achieve satisfactory establishment. Again this will be done outwith the defined buffer zones.

Archaeology will be protected as open ground in agreement with the West of Scotland Archaeological Service and as informed by the commissioned archaeological desk-study and ground survey.

4.4.2 Coniferous woodland

The main commercial species, at some 80% of the proposed planted area, will be Sitka spruce. The planting will also include Larch, Scots Pine and Douglas fir accounting for 4%.

The area will be managed through the establishment period to achieve a minimum average stocking density within the productive conifers areas of

2,500 trees per hectare at year five and maintained at this level until the end of the contract period.

4.4.3 Semi-natural woodland

Semi-natural broadleaves will account for 15% of the planted area.

Choice of semi-natural woodland types is dependent on the pre-existing open ground NVC types as per guidance given in Forestry Commission Bulletin 112 Creating New Native Woodlands. The native woodland elements of this proposal are intended to establish a number of native woodland types using NVC design principles by employing the Ecological Site Classification Decision Support System (Technical Annex E). This will ensure species choice reflects site type.

The principal woodland National Vegetation Classification (NVC) types that would be silviculturally possible at Carrick, as predicted by ESC, are:

Table 4.2: Main NVC woodland types proposed for Carrick in descending order of importance.

NVC TYPE	LOCATION
NVC W4 Downy birch with purple moor-grass.	Wetland/marshy grasslands including along riparian zones and treeline areas. The latter to include birch, rowan, juniper, eared willow.
W17 Birch with oak and rowan.	To include high proportion (>60%) of birch (*Betula pubescens*).The scope for oak may be limited to bracken areas where the soils are likely to be more suitable.
W18 Scots pine woodland.	W18 would be more suitable than NVC W17 on the sites with the poorest nutrient regimes, typically on hilltops. Major recommended tree is Scots pine plus birch (*B pubescens)* and rowan. Not within biogeographic zone for pinewood but could provide good habitat to encourage black grouse.
W11 Oak with birch.	Alternative to W17 on the lower and richer soils – very limited scope.

Source: Technical Annex E

All trees for the semi-natural areas will be sourced from seed of local upland

provenance. Plants grown from seeds collected from Native Seed Zone 106 will be utilised as far as possible with plants from zones 105 and 107 (all west coast) being used in the absence of zone 106 stock.

A key element of the native woodland proposal is the establishment of 47 hectares of low density treeline woodland intended to encourage blackgrouse and the prey base for Golden Eagle.

Following planting of broadleaves, the level of browsing damage will be monitored and the need for further protection measured assessed.

4.5 **Associated Works**

4.5.1 Forest roads

The proposed forest roads at Carrick will be developed under two phases covering forest roads (establishment) and forest roads (harvesting). The proposed route of the forest road system is shown on the planting plan map (see Maps/Provisional Planting Design/Carrick Planting with Roads).

Forest roads (establishment)

Initially, tracks will be used to mark out the site and to service ground preparation, planting, maintenance and wildlife management objectives. These will be for light vehicles and quad bikes.

Forest roads (harvesting)

The forest roads (harvesting) line is intended to follow the forest road

(establishment) line. However, at this stage it is indicative only and has been designed around current harvesting practices. Upgrading the forest road

(establishment) route to a standard capable of carrying timber traffic being gradually undertaken as the forest approaches production circa 2040. The roading proposals may therefore be modified in line with practice at the time and will go through whatever regulatory process is current at that time.

The proposed road line has formed part of the landscape and visual analysis assessment (see Technical Annex B) but may be subject to an EIA determination by Forestry Commission Scotland at the appropriate time.

All water crossings will be discussed with SEPA including the need for registration or licencing. Water crossings pose a risk to otters and therefore all crossing points have been the subject of an otter survey (see Technical Annex I).

Construction of roads will utilise stone excavated from borrow pits as close to the roadline as possible. All work will be carried out in accordance with current guidelines following consultation with the relevant agencies.

Timber transport is proposed to take place via the local in-forest timber haul route and by sea and is fully discussed under Section 5.8 and Technical Annex K.

Responsible public access will be facilitated by the new forest road system. While there are no proposed Core Paths within Carrick, discussions have taken place with the National Park Access Officer to ensure that existing routes are integrated into the planting design. This is fully discussed under Section 5.10.

5. ASSESSMENT, IMPACT PREDICTION AND MITIGATION

As mentioned in Section 1, there are eight broad issue areas, identified at the Screening Meeting, in FCs EIA determination letter dated 14/9/2011 and in subsequent correspondence, which could have potentially significant impacts related directly to the establishment of mixed woodland at Carrick. Three are weighted as having high importance (landscape, ecology, timber haulage), two as medium importance (archaeology, hydrology,) and three as low importance (social and economic, deer management and public access). This section addresses the potential impacts of the proposed scheme on these identified issues, assesses the degree of significance and any mitigation measures required.

5.1 Key Issue 1: Archaeology

This section should be read in conjunction with Technical Annex A: Archaeological Appraisal.

5.1.1 Potential impacts

- Loss or damage of archaeological remains by ground preparation, planting, quarrying and forest road construction.

- Loss, damage or obscuring of archaeological remains by tree growth.

5.1.2 Baseline information and survey

Desk-based assessment and walkover survey of the project area by Headland Archaeology (UK) Ltd.

Sources for desk-based assessment included:

- WoSAS Sites and Monuments Record (SMR)
- Scheduled Monuments, Listed Buildings and Inventory of Gardens and Designed Landscaped held by Historic Scotland.
- Historic maps held by the National Library of Scotland including the Roy Military Map of Scotland (1747-55) and First Edition OS Maps (1869).
- Aerial photos from RAF sorties between 1946, to 1955 and 1960 and the All Scotland Survey of 1988.

The walkover survey took place between 1 and 2 March 2012.

The following aspects of cultural heritage were included:

- Designated assets, including scheduled ancient monuments, listed buildings, conservation areas, historic gardens and designed landscapes; and
- Undesignated assets that are of value because of their archaeological or historic interest.

5.1.3 Assessment of impacts on archaeological remains.

This section addresses the potential impact of the project on archaeological remains both in terms of site preparation works and subsequent woodland development. The specific objectives of the cultural heritage study were to:

- identify the cultural heritage baseline within the proposed development area;

- assess the proposed development site in terms of its archaeological and historic environment potential, within the context of relevant legislation and planning policy guidelines;

- consider the potential and predicted effects of the proposed development on archaeological sites within 1km of the proposed development boundary; and propose measures, where appropriate, to mitigate any predicted significant adverse effects.

Ground preparation, forest road construction and machine tracking can damage archaeological remains as can the development of tree cover which can obscure and/or prevent access to historic sites.

To mitigate any potential for damage during site preparation or loss of interest through tree establishment, all significant archaeological remains have been identified and mapped. These have been discussed with the West of Scotland Archaeological Service (WoSAS) to help determine the appropriate prescriptions for the cultural remains in relation to their significance with reference to NPPG.

The proposed cultural heritage protection strategy, as mapped in Technical Annex A, is summarised below:

Table 5.1: Cultural heritage protection strategy for Carrick as advised by Headland Archaeology

Area	Description	Mitigation
1	Loch nan Cnaimph Stone built shieling settlement	10m buffer around site marked by temporary, high visibility cane markers which demarcates limit of ground prep or planting.
2	Cormonachan Burn Stone built shieling settlement – now turf banks only.	10m buffer around site marked by temporary, high visibility cane markers which demarcates limit of ground prep or planting.
3	Upper reaches of Carrick Burn below Creagan Tarsuinn Shieling settlement and possible cairn	10m buffer around site marked by temporary, high visibility cane markers which demarcates limit of ground prep or planting.

4	Lower slopes to the rear of Carrick Castle settlement Field systems/enclosures including head dyke and rig and furrow.	10m buffer around site marked by temporary, high visibility cane markers which demarcates limit of ground prep or planting. Ensure visual link between Area 4 and Carrick Castle is maintained.
5	Doire Liath Sheiling hut.	10m buffer around site marked by temporary, high visibility cane markers which demarcates limit of ground prep or planting.

The above protection strategy has been used to inform the overall iterative design plan for the proposed woodland.

All sites of significant archaeological importance, as listed in the above table will be mapped and clearly marked on the ground prior to any operations being started.

Demarcation to prevent avoidable, accidental damage occurring to the remains during forestry activities will include fencing with high visibility temporary cane markers and a buffer zone of at least 10m devoid of ground preparation and tree planting will be maintained beyond the outmost recognised feature of each site to avoid damage from tree throw and root networks. Any drains required will be at least 30m from the perimeter of defined significant archaeological sites to avoid inadvertently drying out sites that may contain waterlogged deposits. No new planting would occur in areas identified for archaeological conservation.

The ground preparation operator will be closely supervised by the site manager and both will hold a copy of the archaeological sensitivities map and UPM Tilhill's Toolbox Talk on protecting archaeological remains.

Any additional potential archaeological remains identified by the site manager during the course of marking out or by the machine operator during the course of site preparation operations, will be identified on the ground and WoSAS consulted with a view to assessing the significance of such sites.

5.1.4 **Predicted impacts on archaeological remains.**

- No impact as all archaeological remains identified in the Archaeological Report will be fully protected *in situ* and managed as open ground.

- No significant effects are predicted on any of the cultural heritage resources within 1km of the proposed development area. A visual link will be maintained between the cultural remains in Area 4 with Carrick Castle.

5.1.5 **Mitigation.**

The guidelines for new planting contained in The Forestry Commission document Forests and historic environment (2010) will be followed. All mitigation works will take place prior to ground preparation and planting.

All sites identified in the Carrick Archaeological survey will be mapped and marked to an agreed buffer zone prior to operational works.

Other mitigation measures:

- Project manager, machine operators and planters will hold copies of the activity map showing archaeological exclusion areas and UPM Tilhill's Toolbox Talk on archaeology.

- All significant archaeological remains will be monitored for self-seeding trees.

5.1.6 **Statement of significance.**

The impact of this project on the archaeological interest of the

site is deemed to be neutral and not significant.

5.2 Key Issue 2: Landscape and visual assessment

This section should be read in conjunction with Technical Annex B: Landscape and Visual Assessment, which contains maps and illustrations explaining the design process and development of the proposals.

5.2.1 Potential impacts

- Change to landscape and visual character through conversion of open ground to woodland and scrub.

- Landscape/visual impacts due to construction of forest roads.

5.2.2 **Baseline information and survey**.

Draft National Park Plan 2012-2017.

Landscape Assessment for Argyll and the Firth of Clyde.

Local Woodland and Forestry Framework, Loch Lomond and The Trossachs National Park.

There are no national or regional landscape designations within the Carrick estate project area. However, it is considered to lie in a relatively sensitive location. In view of this, a full landscape and visual appraisal was commissioned to inform the woodland design process.

5.2.3 **Landscape Planning and Policy**

Carrick Farm is situated within Loch Lomond and The Trossachs National Park and on the eastern edge of the Argyll Forest Park and is therefore subject to a number of policy considerations, aimed at encouraging the development of landscapes which reflect the aspirations of local people.

Throughout the National Park, it is recognised that woodland and forestry make an increasing contribution to the special qualities of the park with benefits to local communities, the economy, land management, recreation and tourism and natural and cultural heritage. New woodland should therefore be designed to secure scenic, ecological, land management and recreational benefits to enhance these qualities.

Carrick is in the Cowal area of the National Park, where key issues that affect the property include the fact that woodlands and forests are an important component in local identity and culture. It is recognised that there are limited

options for woodland expansion that will not affect the remaining farmland and hill habitats in the area. In the framework document, the recommended approach and emphasis seeks to bring broadleaved woodland into management, thus offering protection for this valued resource. The importance of Forest Habitat Networks is emphasised and enhancement of way marked paths for cycling and horse riding which link into the core path networks, long distance and hill paths is supported.

5.2.4 Landscape Character and Context

Key issues identified in the Landscape Character Assessment for Argyll and the Firth of Clyde include the siting and design of forests in the landscape and threats to semi-natural habitats. Landform is the dominant design influence and a gradual transition uphill from loch shore, to broadleaved woodland to conifers is promoted.

Carrick Farm lies on the western shore of Loch Goil, a sea loch that links into Loch Long. In the Landscape Assessment for Argyll and the Firth of Clyde, the property forms part of the 'Steep Ridgeland and Mountain' landscape type in the Cowal Ridges Landscape Character Area. This landscape character type is typified by dramatic mountain ridges with steep slopes and rocky outcrops. Conifer plantations occupy much of the lower slopes with open moorland and rock outcrops above. Scattered broadleaved woodland is also a characteristic, with birch woodland along burns and in patches on upper slopes and oak woodland on lower sheltered slopes. Most settlements occur along the narrow loch edge strip.

The landscape around Carrick is made up of distinct ridges with rounded

profiles, narrow divides and steep sided glens which are relatively inaccessible. Glacial features such as hanging valleys, waterfalls and lochans are typical of the general area. Historically conifer plantations in the area have often been insensitive to landform influences and smaller plantations out of

scale with the landscape. Major changes to the composition of managed plantations around Loch Goil are taking place as they enter the second rotation, both in terms of structural diversity and species pattern.

The proposed new forest forms the backdrop to the hamlet of Carrick Castle. Although the resident population is dispersed, within the immediate area there are several tourist facilities, including a large caravan and chalet development. In addition, the area is a popular destination for visitors, increasing the sensitivity of the site to landscape change.

Views of Carrick from the surrounding landscape are contained within the loch basin, mainly from the dispersed local road network but also from forest and hill tracks as well as from the loch itself. The main panoramic views of Carrick are from the opposite shore of Loch Goil, where a forest track through Ardgoil Forest provides a number of vantage points. There are also more distant views across the loch from Garelochhead and from Loch Goil. The approach road from Lochgoilhead also provides views into the property from Cormonachan. The location of Carrick Castle hamlet and other tourist facilities in the area is likely to make new woodland, with tracks, attractive for recreational access (see Section 5.10). Views from Carrick and within the site are therefore also important as is the general experience of the landscape.

Three main viewpoints from the surrounding landscape were agreed with consultees in order to assess the landscape effects of new planting at Carrick and to aid the design process. These viewpoints include a distant view from Portincaple above the shores of Loch Long, a view from the approach road to Castle Carrick near Cormonachan Glen and a third view from the forest track through Ardgoil Forest on the opposite slope of Loch Goil. Landscape effects of the proposed woodland development are

illustrated in Technical Annex B.

5.2.5 Site Description

Carrick Farm extends to around 1526 ha on the western shore of Loch Goil and is dominated by the craggy ridge which stretches from Beinn Bheula (779m) to the north of the property to just north of Ardentinny on Loch Long. The ridge is made up of several high peaks, including Sgurr a' Choinnich (661m), Cruach a Bhuic (635m) and Creachan Mor (652m), with less prominent summits in between. The upper slopes of the property support semi-natural vegetation subdivided by rock outcrops and grade downhill to Loch Goil at the bottom of the slope. This slope is crossed by numerous watercourses which flow into Cormonachan Glen to the north, the Carrick Burn in the centre of the slope and two further less prominent burns to the south. Much of the landform has been shaped by glacial activity resulting in distinct rounded glens with post glacial down cutting.

Throughout the property, vegetation is made up of a mosaic of semi-natural habitats which have been heavily grazed in some areas. Woodland is also a characteristic of the site, with the most prominent woods in the southern section stretching between the loch shore and the prominent ridge of Cruach an Draghair (397m). Stands of upland birch woodland are scattered throughout the site, with the larger stands surviving in areas least accessible to livestock and deer.

Plantation forest is also a major feature in the landscape. Carrick is adjacent to Cormonachan and Knapp Forests, both currently managed by Forest Enterprise. These forests are in the production phase and are gradually being replaced by more diverse species including significant areas of broadleaved woodland. A smaller even-aged plantation, planted in two phases, is situated in the gully to the south west of Castle Carrick and is made up predominantly of spruce, subdivided by native woodland along the many internal watercourses.

Castle Carrick village stretches along the access road at the bottom of the

slope, adjacent to the loch shore. A number of small fields are located behind the village. There are several access routes on the property, most of

which service the lower slopes with ATV tracks to higher ground.

5.2.6 Design Process

The proposal to establish woodland on Carrick has been subject to a full landscape and visual appraisal within the context of the background policy and forest design guidance. The key stages in developing the planting proposals included the following assessments:

- site survey and a photographic record of the current landscape,
- landform appraisal and visual issues,
- identification of issues influencing the design of the proposals,
- preparation of a Design Strategy,
- preparation of an outline Planting Plan,
- illustration of outline Planting Plan from 3 main viewpoints in the surrounding

  landscape.

Stages in the Design Process are set out in detail in Technical Annex B.
The main landscape effect of the proposals is the establishment of woodland and scrub. The establishment of roads and tracks to service the proposed woodland has been subject to a similar Design Process as the eventual construction of forest roads to service timber harvesting will also affect the landscape as permanent features.

5.2.7 Predicted landscape effects

The main predicted impacts are:

- the development of woodland and scrub on land historically maintained as rough pasture.

- the construction of forest roads which will remain as permanent features.

The development of woodland and scrub will change the landscape from a predominantly open grazed hillside to a diverse woodland landscape with extensive areas of open ground and enhanced areas of broadleaved woodland. The visual effects will change the character of both external and internal views of Carrick as there is a gradual increase in forest and woodland cover.

The Landscape Assessment has been used to influence the extent of woodland development and the shape of external and species boundaries. Landform has been the dominant design influence closely followed by site constraints of elevation and the presence of valued habitats and species, including Golden Eagles.

Within the scheme, species have been chosen to reflect site types and to create visual and textural diversity, at an appropriate level, as influenced by the Design Strategy. Spruce will be the main productive species, sub-divided by areas of open ground, allowing windfirm boundaries to develop and creating a matrix which will give rise to future management flexibility once the proposed forest enters the production phase. The main contrast species will be broadleaves, which display seasonal diversity. Broadleaved woodland will be concentrated around:

- the loch edge to create a woodland habitat corridor linking the FE PAWs restoration sites at Cormonachan and Knapp Forests;

- Carrick Burn to reinforce existing semi-natural woodland areas and assist woodland habitat network linkage with loch side woodland areas;

- semi-natural treeline and scrub areas with the aim of improving the prey base for Golden Eagle and contribute to long term forest structure.

The proposals above will result in time in a significant enhancement in the

area of broadleaved woodland on the property and the planting will be informed by ESC (see Technical Annex E).

Stands of conifers other than Sitka spruce will be located on suitable sites on lower slopes to form part of the long term forest structure. It is anticipated that these stands will be worked on a longer rotation than spruce stands and will therefore provide continuity in the landscape once the forest enters the production phase (circa 2040).

Semi-natural and tree line woodland will be created by low density planting of native species. This woodland has been designed to relate to the broadleaved woodland network as part of the long term forest structure, so that it will not become visually isolated once the productive element of the proposals reach the production stage.

Internally, areas of light stocking and open ground will be integrated, relating to landform pattern and to archaeological and ecological features as noted in the relevant Technical Annexes. These areas of open ground will be designed using natural shapes and graded margins. They will create spatial variety within the woodland, benefiting visual diversity and habitat provision (by increasing internal woodland edge). The varied nature of the site, with many rocky outcrops and small bog habitats will naturally create a diverse texture

within planted stands.

Where possible road lines have been located to limit visual impact and where the landscape effects will diminish as trees become established. The nature of the terrain on Carrick, with areas of bog habitat, steep slopes and rocky outcrops, limits options for road construction.

The proposed forest roads at Carrick will be developed under two phases covering forest roads (establishment) and forest roads (harvesting).The proposed route of the forest road system is shown on the planting plan map. (See: Maps/Provisional Planting Design/Carrick Planting with Roads). Initially, tracks will be used to mark out the site and to service ground preparation, planting, maintenance and wildlife management objectives. These will be for light vehicles and quad bikes.

The forest roads (harvesting) line is intended to follow the forest road (establishment) line. However, at this stage it is indicative only and has been designed around current harvesting practices. Upgrading the forest road (establishment) route to a standard capable of carrying timber traffic being gradually undertaken as the forest approaches production circa 2040. The roading proposals may therefore be modified in line with practice at the time and will go through whatever regulatory process is current at that time.

The proposed road line has formed part of the landscape and visual analysis assessment (see Technical Annex B/Roading Supplement)) but may be subject to an EIA determination by Forestry Commission Scotland at the appropriate time.

Timber transport is proposed to take place via the local in-forest timber haul route and by sea and is fully discussed under Section 5.8.

5.2.8 Mitigation

The predicted impact on the landscape of woodland and scrub development has been critically appraised from several agreed local viewpoints, using annotated computer generated illustrations, approximately 20 years after planting, to help inform how any potentially adverse landscape impacts might be mitigated (Technical Annex B).

The landscape impact of forest roads has also been assessed, resulting in the location of roads where visual impact will be controlled, where possible. Road impact will diminish as the trees become established.

Overall, planting proposals have been developed to take into account a range of environmental and commercial interests, to produce a well-structured layout, which will provide a diverse forest landscape into the future. Significant areas of unplanted ground will remain along the main ridge and the prominent local ridge above Carrick Castle. In addition, areas of blanket bog will not be planted thus creating natural openings within the woodland. The presence of nesting Golden Eagles has also resulted in areas of potentially plantable land being integrated into the open ground

network to conserve feeding areas.

Planting this site will create a gradual change from heavily grazed open hill to diverse plantation forest and significantly enhance the broadleaved woodland network in the locality. The plantation layout will reflect the natural characteristics of the landscape.

The proposed woodland, designed to follow current landscape guidelines, will impact positively on the landscape by providing structural and textural diversity to a landscape largely denuded of woodland cover by long-term grazing impacts.

5.2.9 Statement of significance

The overall landscape impact of this project is judged to be long-term, beneficial, irreversible and significant.

5.3 Key Issue 3a: Ecology – Habitats

This section should be read in Technical Annex C: Ecology Report and Technical Annex D: Habitat Survey. Potential effects on birds are assessed separately under Key Issue 3b. Potential effects on protected species are assessed separately under Key Issue 3c.

5.3.1 Potential impacts

- Loss and fragmentation of open ground habitats.

- Reduction in extent of acid grassland, wet grassland and upland heath.

5.3.2 **Baseline information and survey**.

Phase I/NVC vegetation survey 2010.

Species data, including legally protected, UK BAP, LBAP, Nationally rare/scarce and RDB species from National Biodiversity Network databases covering the project area.

Loch Lomond and The Trossachs National Park Biodiversity Action Plan 2008-2011.

5.3.3 **Assessment of impacts on acid grassland, wet grassland and upland heath**

The predominant open ground vegetation types subject to proposed afforestation are acid grassland, wet grassland and upland heath. Areas of deep peat >50 cms are not included in the outline planting map.

This section addresses the potential impact of afforestation on these open

ground habitats, assesses the magnitude and degree of significance and any mitigation measures required using protocols developed by the Institute of Ecology and Environmental Management (IEEM).

Acid grassland

The dominant vegetation type, occupying some 38% of the area (588 ha) is species-poor acid grassland of two main NVC types: U5a *Nardus stricta-Galium saxatile* grassland and U6 *Juncus squarrosus-Festuca ovina* grassland in damper areas. Much of this community has been derived from wet heath as a result of long-term grazing impacts. These communities are "very often a secondary vegetation type, strongly encouraged by particular kinds of grazing and burning treatments" (Rodwell 1992).

Acid grassland has declined as a result of agricultural intensification and afforestation with a 21% loss recorded between 1940 and 1980 (National Countryside Monitoring Scheme). However, according to the Habitat Statement within Biodiversity: The UK Steering Group Report (Volume 2: Action Plans), it is “one of the most extensive semi-natural habitats in Britain……estimates suggest that there is in excess of 1,200,000 hectares of acid grassland in the uplands”. In the uplands “much acid grassland is often of low biological interest and is the product of poor management of other priority habitats, such as dwarf-shrub heath”. Indeed Averis et al (2004) note that NVC U5 and U6 are “regarded as a conservation problem rather than an asset”.

The area of acid grassland within the National Park is not known with any confidence (Diack pers comm) due to problems of definition and lack of data so no estimate can be given of the area the resource at Carrick represents at a National Park scale. Under the Argyll and Bute LBAP covering unimproved grassland the current status is described as “widespread representing approximately 32.7% of the land surface of Argyll & Bute. By way of comparison, the same land type classes represent 19.3% of the total area of Scotland”.

While acid grasslands are typically species-poor, the examples at Carrick (NVC types U5a, U6b and U6d) have been further reduced in species diversity by long-term stock grazing and enrichment impacts and attempts to improve the lower elevation examples to create improved (NVC MG6) grassland. They are considered to be of medium value at the local scale.

Wet grassland

Wet grassland is also extensive across the site covering 26% (400 ha) and includes NVC types M25 *Molinia caerulea-Potentilla erecta* mire and M23 *Juncus acutiflorus-Galium palustre* mire. Some of the M23 can be locally base-influenced and therefore more species-rich with *Carum verticillatum, Dactylorhiza maculata, Caltha palustris* and *Filipendula ulmaria.*

M23 and M25 blend in and out without discrete boundaries and share several of the main associate species. These vegetation types are typically plagioclimax types produced and maintained by stock grazing (Rodwell, 1992).

Wet grassland, under the generic title of purple moor grass and rush pastures (*Molinia-Juncus*), is subject to a costed UK Habitat Action Plan. The UK Steering Group Report states that the total extent of the habitat in the UK is about 56,000 ha though this figure should perhaps be treated with caution given that survey work has not been extensive (or consistent) in some areas. Certain key communities of purple moor grass vegetation fall within Annex I of the Habitat and Species Directive (e.g. *Molinia* grasslands on calcareous soil). This refers to species-rich mixtures of purple moor-grass and sharp-flowered rush in fen meadow situations, so the large expanse of acid *Molinia* dominated habitat at Carrick is not included.

The area of wet grassland (NVC M23/M25) within Loch Lomond and The Trossachs National Park is not known with any confidence (Diack pers comm) due to problems of definition and lack of data so no estimate can be given of the area the resource at Carrick (circa 400 hectares) represents within a

National Park context. However, taking the UK estimate, it is thought that regionally it covers a smaller area than acid grassland.

Like acid grasslands, wet grasslands have declined in extent and quality as a result of agricultural modification, drainage, reclamation and afforestation. Whilst they can be important habitats for breeding birds and butterflies there are no records to suggest that they provide this resource at Carrick (source: Breeding Bird Report and Prescott pers comm). Averis et al (2004) however note that “mires of this type contribute to the diversity of flora and vegetation structure around the upland fringes”.

At Carrick it is more species-rich than acid grassland which, in view of its UK HAP status, has high local importance and moderate regional importance. The presence of *Carum verticillatum* adds to the nature conservation value.

Upland heath

Upland heath at 18% or 270 hectares of the project area is mainly composed of NVC M15 *Trichophorum cespitosum-Erica tetralix* wet heath. It is closely associated with, and grades into, blanket mire NVC M17 *Trichophorum cespitosum-Eriophorum vaginatum* mire the latter covering 8.4% or 129 hectares of the project area. The M15 is typified by *Trichophorum cespitosum, Erica tetralix, Calluna vulgaris,* and *Sphagnum capillefolium*. On well-drained ground this is replaced with H12 dominated by *C. vulgaris* with some *Vaccinium myrtillus.*

Upland heath is subject to a UK Habitat Statement. There is approximately 2,514,000 hectares of this habitat in Scotland, much of it forming intergrades with acid grassland as a result of long-term grazing impacts. The recommended conservation direction is to “maintain the extent, enhance the quality and restore upland dwarf-shrub heath as part of upland mosaics and transitions of semi-natural habitats……”

The area of upland heathland within Loch Lomond and The Trossachs National Park is not known with any confidence (Diack pers comm) due to problems of definition and lack of data so no estimate can be given of the area the resource at Carrick (circa 269 hectares) represents with a National Park context. However, it is an extensive habitat in a Scottish context with the examples at Carrick showing little species or structural diversity as a result of grazing intensity.

Upland heath has declined in extent and quality as a result of agricultural modification, drainage, reclamation and afforestation. However, it remains a very extensive habitat in Scotland though its inclusion in the UK Steering Group report means the area of upland heathland at Carrick is considered to have high local importance and moderate regional importance.

Predicted changes

Changes within these habitats as a direct result of afforestation can be approximated as follows:

Table 5.2: Predicted changes within acid grassland, wet grassland and upland heath as a consequence of afforestation at Carrick.

Habitat	**Current area (Ha)**	**Current habitat condition**	**Predicted area following afforestation**	**Predicted habitat condition**	**Approx change (Ha)**	**Nature of change**
Acid grassland (U5, U6)	588	Ecologically over-grazed, low species diversity	457	56 ha ungrazed, rank under broadleaves. 75 ha lost to conifers.	- 131 ha	Significant at local scale only
Wet grassland (M23/25)	400	Modified by grazing and drainage	188	47 ha ungrazed, rank under broadleaves 165 lost to conifers	- 212 ha	Significant at regional scale.
Upland heath (M15/H12))	270	Modified by grazing and drainage	187	Ungrazed, rank	- 83 ha	Significant at regional scale.

The above table predicts the likely significant effects on acid grassland, wet grassland and upland heath should this project proceed. The draft planting plan has excluded the areas of blanket bog.

In summary:

- The area of NVC communities U5, U6c/U6d will be reduced from 588 hectares to 457 hectares. The area of NVC communities M23/M25 will be reduced from 400 hectares to 188 hectares. The area of NVC M15 will be reduced from 270 hectares to 187 hectares.

- The distribution of U5, U6, M23, M25 and M15 will be reduced and fragmentation increased.

- The area and distribution of blanket mire > 50 cms (M17) will be unaffected.

- The viability of associated plant species may be compromised to include negative impacts on Whorled Caraway (*Carum verticillatum*).

These predicted impacts cannot be mitigated except for the retention of examples of these habitats across the site –some 60% of the farm remaining unplanted. The structure and species composition of retained examples is likely to differ from the current baseline conditions as a result of stock removal and deer control measures. This is likely to encourage a more rank sward to develop and the likelihood of natural regeneration of semi-natural broadleaves from rootstock and self-seeding. However, deer browsing in the longer-term may help in maintaining plagioclimax conditions on the remaining open ground habitats.

Further, acid grassland, wet grassland and upland heath communities will be retained as a ground layer within the 81 hectares of proposed semi-natural woodland areas.

5.3.4 Predicted impacts of afforestation on main open ground habitats

- Loss or change in structure and composition of substantial areas of acid, wet grassland and upland heath.

- Fragmentation of acid, wet grassland habitats and upland heath.

5.3.5 Mitigation of predicted impacts

- Planting plan to ensure retention of 62 % open space to include substantial areas of acid grassland, wet grassland and upland heath.
- Ungrazed acid, wet grassland and upland heath NVC types will be retained as a ground layer below the areas of proposed semi-natural woodland.

5.3.6 Statement of significance

The impact of this project, without mitigation, on the open ground habitats is deemed to have a high magnitude impact. For acid grasslands this is deemed to be significant at the local scale and for wet grassland and upland heath at the regional scale over the medium to long-term.

5.4 Key Issue 3b: Ecology – Birds

This section should be read in conjunction with Technical Annex C: Carrick Ecology Report and Technical Annex F: Bird Survey 2011.

The potential impact of this project on Golden Eagle is assessed under a separate confidential report (see Technical Annex J).

5.4.1 Potential impacts

- Displacement of birds of open ground habitat by woodland establishment.

- Disturbance to breeding birds during site planning, ground

preparation, planting and other forest operations.

5.4.2 **Baseline information and survey**.

Species data, including legally protected, UK BAP, LBAP, Nationally rare/scarce and RDB species.

Breeding bird survey 2011 (using Brown and Shepherd [1993] methodology) amounting to 46.5 km (20.5 hours) of survey.

Records of current and historic black grouse leks on site and within the local area from RSPB and FCS.

Black grouse lek search on site in 2012.

Loch Lomond and The Trossachs National Park Biodiversity Action Plan 2008-2011.

5.4.3 **Assessment of impacts on birds.**

This section addresses the potential impacts of the project on birdlife in

terms of habitat change and operational disturbance. It assesses the magnitude and significance of impacts and also assesses any mitigation measures that might be required.

The negative impacts, should this project be implemented, relate to two factors: direct impacts due to loss of open ground habitats and/or indirect impacts as a result of operational disturbance.

Direct Impacts: Breeding Birds

Species requiring open ground were targeted during the breeding bird survey. The only wader recorded was Common Snipe with no confirmation of territorial or breeding behaviour. Two displaying Skylark were recorded. One confirmed Raven nest was found at Creag Dubh na Criche and a possible second nest was also located at Ardnahein.

Taking the current area of open ground habitats at Carrick at 1463 hectares (1526 minus 63 hectares of existing semi-natural broadleaves) the projected conversion of 554 hectares (38%) to woodland will leave an area of 909 hectares (or 62%) of open ground. A crude indicator of the potential of this change of open ground to woodland habitat would be to assume a concomitant 38% displacement of birds requiring this habitat. This approach is summarised below:

Table 5.3: Predicted impacts of project implementation on birds of conservation concern requiring open ground habitats.

Habitat	Baseline area of open ground	Predicted area of open ground following afforestation	Approx change (Ha)	Baseline population	Predicted impact	Significance
All open ground habitats:	1463 ha	909 ha	- 554ha	Skylark: 2 territorial males	- 1 territorial males	Local
				Wheatear: 5 individuals	- 2 individuals	Local
				Snipe: 2 individuals	- 1 individuals	Local
				Golden eagle	Displacement unlikely[1]	Natioanal

Assumptions: 1. Figures for loss of species based on 62% open ground remaining. 2. Residual open ground (909 ha) will continue to be used by remaining birds i.e. no edge effects.
[1]See Confidential Eagle Chapter Annex J

It is difficult to predict the potential effects of project implementation on the basis of one season's survey especially given the paucity of the breeding bird numbers at Carrick. But the main displacement impacts may result in the loss from the site of 1 territorial male Skylark, 1 Snipe and 2 Wheatear.

Taking another approach, the outline planting map can be transposed

onto the mapped bird territories (see Technical Annex F). This would indicate that both Skylark territories would be displaced, both individual Snipe and 3 of 5 individual Wheatear would be displaced by the planting proposals. Displacement will take place over the medium to long-term.

The significance of potential displacement to Skylark, Snipe and Wheatear should be set within the known population trends of these species:

- Skylark: The UK population is estimated to be holding 1,785,000 breeding territories. In the UK, the population halved during the 1990s, and is still declining. In England, within the preferred habitat of farmland, Skylarks declined by 75% between 1972 and 1996 as a result to changes in, and intensification of lowland farming. Its decline in Scotland however has been much less dramatic with BTO figures for the Breeding Bird Survey 1995-2009 showing a 5% increase particularly in coastal and upland habitats with the trend being stable suggesting that they are not subject to such intense land-management pressures as further south.

- Snipe. The UK population is estimated to be 60,000 breeding pairs. There is uncertainty as to the size of non-breeding populations; in Britain this is estimated as being significantly greater than 100,000 (Cayford and Waters 1996, Stone et al 1997). The Breeding Bird Survey (BTO), as it relates to Scotland, suggests a continuing population increase of 50% over the period 1994-2009.

- Wheatear. The UK population is estimated to be 56,000 breeding pairs. The Breeding Bird Survey (BTO), as it relates to Scotland,

  suggests a continuing population increase over the period 1994-2009 of approximately 3%.

Scottish population trends are summarised below:

Table 5.4 Bird population trends in Scotland 1994-2009

Species	Trend
Skylark	+ 5%
Snipe	+ 57%
Wheatear	+ 3%

Adapted from the BTO Breeding Bird Survey 1994-2009

Project implementation is likely to result in woodland and woodland edge species consolidating and increasing their tenure on the estate, e.g. Sparrowhawk, Hen Harrier. Species recorded in the 2011 breeding bird survey likely to benefit from woodland expansion include Tree Pipit and Bullfinch (BoCC red-list species). Woodland establishment of the type proposed has the potential to benefit Black Grouse. While some of this benefit will be temporary in nature, the development of graded woodland edges, internal open space and the planting of semi-natural broadleaves, known to benefit Black Grouse, will allow for longer-term benefits.

The felling and restocking of surrounding plantations to the north and south of Carrick will also assist in creating a range of woodland age and structure likely to benefit Black Grouse conservation (Owen 2011).

Direct Impacts: Black grouse

There are no current black grouse records for Carrick (Boles, RSPB pers comm). The closest known lek is at Lochgoilhead (NN211013) which held four displaying cocks in 2011. The 2011 breeding bird survey showed no evidence that Carrick is used by this species.

Considerable survey effort was put into detecting use of the site by Black Grouse in 2012. Historical leks were checked and 3km of suitable woodland

edge habitat surveyed for lekking males in April 2012. No black grouse or signs of black grouse (droppings, feathers) were recorded.

Indirect Impacts

Operationally it is important to ensure that the timing of site planning, ground preparation, planting and road construction avoids any potential impacts on breeding birds. The advice contained in Forest and Birds (FCS Guidance Note 32 Forest Operations and Birds (2006) should be adhered to with regard to timing of operations and required buffer zones.

Particular scrutiny must be given to proposed operations during the breeding period between March and August. To ensure compliance with the Wildlife and Countryside Act 1981 and the Nature Conservation (Scotland) Act 2004, UPM Tilhill will apply their own environmental controls under their accredited and externally verified ISO 14001Environmental Management System (see Other Annexes/Toolbox Talks and Other Guidance).

5.4.4 Predicted impacts on birds

Direct Impacts

- Displacement of 2 territorial male Skylark, 2 Snipe and 5 Wheatear.
- Increase in birds of woodland and woodland edge habitat.

Indirect Impacts

- Potential for operational disturbance to breeding birds.

5.4.5 Mitigation of impacts

- Retention of 909 hectares (62%) open space allows for mitigation to predicted displacement effects.

- Follow advice in Forest Operations and Birds (FCS, 2006) to help avoid operational disturbance at the temporal and spatial level.

5.4.6 Statement of significance.

The impact of this project on birds requiring open ground habitats is considered to be negative, irreversible but not significant on account of the poor breeding bird assemblage at Carrick and the retention of 62% open ground habitat.

5.5 Key Issue 3c: Ecology – Protected Species

This section should be read in conjunction with Technical Annex C and I.

This section addresses the potential impacts of the project on otter in relation to operational disturbance and habitat modification caused by woodland development. It includes an assessment of the degree of significance and mitigation measures required.

5.5.1 Potential impacts

- Disturbance to a European Protected Species as a result of ground preparation, planting and water crossings/bridge construction in riparian zones.

5.5.2 Baseline information and survey

An otter survey was undertaken on the 8, 10 and 17 August 2012. This included survey for signs of water vole.

5.5.3 Assessment of impacts on protected species

Otters are termed European Protected Species (EPS) and are listed on Annex IV of EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ("The Habitats Directive") as species of European Community interest and in need of strict protection.

For any EPS animal the legislation makes it an offence to deliberately or recklessly capture, kill or disturb any such animal. It is also an offence to damage or destroy their "breeding sites" or "resting places" (this does not have to be deliberate, reckless or intentional for an offence to have been committed). Therefore holts are protected even when there are no otters present, provided it can be demonstrated that they use them some of the time.

EU case law has removed the previous exception to the above offences whereby an offence is not committed if it can be shown that the unlawful act

was the incidental result of a lawful operation or other activity which could not reasonably have been avoided. This means that anyone who *'damages or destroys a breeding site or resting place'* of an otter will not have the '*incidental result'* defence to rely upon and may be liable to prosecution, even if the damage or disturbance was an accidental result of an otherwise lawful activity or operation such as ground preparation, tree planting or bridge construction.

Taking reasonable precautions and following best practice advice is key to protecting EPS and their habitats. This approach starts with surveying the site for otter activity. In the case of Carrick this focussed on all of the water courses crossed by the proposed forest road system resulting in a focussed survey approach (described in Technical Annex I). Pre-operational checks for otter will be undertaken to ensure that the risk to this species is minimised.

No evidence of otter or water vole usage was found. No holts or other resting places were located. However, burn riparian zones will be managed in

accordance with best practice guidelines. This is fully discussed in Section 5.7 below.

Semi-natural woodland establishment according to site type along these riparian zones is likely to improve the prospects for otter providing more cover and improving the biological productivity of water courses over the current baseline.

5.5.4 Predicted impacts

Creation of semi-natural riparian woodland will provide enhanced breeding and feeding opportunities for otter.

5.5.5 Mitigation of impacts

None required.

5.5.6 Statement of significance.

The impact on otter arising from the project is judged to be neutral but with the potential to have medium to long-term benefits

5.6 Key Issue 4: Acidification and impacts on hydrology.

This section should be read in conjunction with Technical Annex H: Analysis of Critical Load Exceedance.

This section addresses the potential impacts of the project on acidification of the catchment and water quality and quantity. It includes an assessment of the degree of significance and mitigation measures required.

5.6.1 Potential impacts

- Increased acidification of surface waters caused by interception of atmospheric pollution by conifers.
- Reduced water quality caused by sediment release from ground preparation for planting or chemicals used to assist tree establishment.
- Reduced water quantity caused by increased interception and evapotranspiration.

5.6.2 Baseline information

- Literature review.
- Liaison with SEPA and FC regarding potential for enhanced acidification risk.
- Liaison with Scottish Water and local community regarding protection of public water supplies.

5.6.3 Assessment of impacts on water quality.

Acidification

In Forestry Commission Scotland's EIA determination letter, dated 14 September 2011, they note that "the location of the proposed new woodland falls within a critical load exceedance square. The requirement for undertaking a catchment-based critical load assessment needs to be determined through discussion with Forestry Commission staff."

Forest canopies can significantly increase pollutant capture, through the "scavenging effect", leading to the acidification of upland soils and surface waters. This is particularly pertinent in areas like Argyll where the buffering capacity of the soils and underlying geology is poor. For this reason, Carrick lies within a critical load exceedance square as defined and mapped in Forest and Water Guidelines (Version 3) which was still the current guidance at the time of the EIA determination stage. It has since been replaced with Forests and Water part of the UK Forestry Standard Guideline series.

In such areas it is normal practice to undertake a Critical Load Assessment as recommended in Forests and Water. This states: "where new planting is proposed within the catchments of water bodies at risk of acidification, an assessment of the contribution of forestry to acidification and the recovery process should be carried out; details of the assessment procedure should be agreed with the water regulatory authority."

The matter was discussed with the Scottish Environment Protection Agency (SEPA) who looked at the proposed scheme's location on their GIS Water Framework Directive (WFD) classification layer, and noted that there are no waterbodies in that area which are classed as failing or at risk of failing good status. They also confirmed that they have no evidence that acidification is, or ever has been, an issue in the Carrick area and therefore the catchment is not at risk from acidification as a result of new woodland establishment.

SEPA's advice, with respect to the proposed woodland planting scheme at Carrick Farm, would be that there is no requirement for a Critical Load Assessment. On these matters, the final decision rests with the Forestry Commission (FC). They confirmed that they agree with SEPAs recommendation (pers comm Dr Tom Nisbet, Head of FCs Water, Soil and Heritage Research Group).

Water quality

Water quality can also be adversely affected by ground preparation, forest road construction and chemical use if best practice guidance is not applied. The proposed methods of woodland establishment including mounding, screefing and shallow ploughing will have minimal effects on soils and water. For example, continuous mounding disturbs in the region of 15-20% of the ground surface and because there are no continuous breaks in the soil profile will result in minimal disturbance to the rate of water run-off. All riparian zones within the project area will have defined buffer zones where no ground preparation or chemical use will occur (Table 5.5). This includes sensitive treatment of all water courses emanating from Carrick. A method statement for ground preparation will be discussed and agreed with FCS prior to implementation (draft Method Statement attached at Other Annex's/Toolbox Talks and Other Guidance).

The minimal methods of cultivation and the spot application of herbicides should ensure that water quality is not affected measurably (Worrell 1996). The hydrology of the localised areas of deep peat will not be affected by ensuring that planting will not take place on peat with a depth greater than 0.5 metres.

At Carrick the following controls will apply to protect water quality, and otter habitat, and further minimise the potential for acidification or diffuse pollution:

Table 5.5 Defined buffer zones where ground preparation, productive conifers and chemical use will not occur.

Buffer width	**Situation**
10 m	Along all permanent watercourses with a channel less than 2 m wide.
20 m	Along watercourses with a channel more than 2 m wide and around all deep peat areas.
50 m	Around abstraction points for all private water supplies

Source: Adapted from Forests and Water

If a consensus on establishing broadleaves within the above buffer zones by direct planting can be agreed then this will be pursued by the applicants as

part of the overall project outputs. This will be a mix of open space with native woodland planted according to site type (see Technical Annex E) without the need for ground preparation, fertilisers or herbicides.

The use of any chemicals, applied by hand-held applicator, for weeding will be undertaken only after liaison with SEPA. All burn crossings will comply with the Water Framework Directive and SEPA licensing procedures.

Water quantity

The proposed change of land use from open ground to mixed woodland potentially runs the risk of reducing average stream runoff (via interception and transpiration losses) in the medium to longer term (Price, 1996). Some reduction in run-off is therefore anticipated however the Local Forestry and Woodland Framework notes that "this is not a major issue in Argyll at present due to high levels of rainfall". Ultimately the proposed new woodland will dampen extreme variations in water run-off and the creation of semi-natural riparian woodland will boost biological productivity of water courses. The proposed mixed nature of the woodland at maturity (included extensive open space) is likely to result in less interception losses compared to that which might arise from a purely mature conifer plantation.

The minimal methods for tree establishment and the application of agreed buffer zones should not have any measurable affect on downstream fisheries. In the longer term a continuous cover of native woodland along watercourses might contribute to reduced erosion (concomitant with reduction of grazing pressures), and dampen extreme variations of run-off.

This proposal will improve the biological productivity of running waters and, by implication, improve the prospects for otter and fresh water fish. Indeed, autumn leaf fall from deciduous trees provides one of the most important food resources to the freshwater ecosystem - a process that has been well

documented (MacKenzie 1996). Further, vegetated riparian areas keep the main channel confined and fallen trees in the stream provide important summer and winter salmonid habitat (MacKenzie 1996).

Despite there being a lack of information regarding broadleaved afforestation and stream water quality (Doake et al 2001) there are many benefits of riparian native trees for freshwater ecosystems such as stabilising river banks; creating in stream shelter and shade, especially for fish; introducing structural habitat diversity; introducing nutrients in complex forms into aquatic ecosystems (via falling leaves and invertebrates) rather than simple forms (enriched runoff) which can stimulate eutrophication responses".

"Planting of scattered broadleaf trees and scrub along watercourse can greatly benefit salmonid fisheries by reducing acidification and erosion whilst increasing food supply and creating shade" (SNH 2001).

5.6.4 **Predicted impacts on the hydrology of the project area.**

Acidification:

- No risk of enhanced acidification from woodland establishment.

Water quality:

- Low risk to water quality where best practice is applied including described buffer zone approach.

- Improved biological productivity and channel structure of watercourses will have positive implications for otter and salmonids.

Water quantity:

- Reduced run-off in medium to long-term compared to baseline.

- Extreme variations in run-off will be dampened i.e. reduced number

and intensity of spates.

5.6.5 Mitigation of hydrological impacts.

- All water courses and areas of deep peat (>50cms) to be protected from mounding by implementation of buffer zones.

- Ground preparation, chemical use and burn crossings will comply with Forests and Water, the Water Framework Directive and associated General Binding Rules.

5.6.6 Statement of significance.

Overall, the impact of this project on the hydrology of the site is deemed to be neutral in the short-term but beneficial and significant over the medium to long-term.

5.7 Key Issue 5: Socio-economic impacts - employment.

5.7.1 Potential impacts

- Loss of hill grazings
- Loss of agricultural employment
- Gain of forestry employment

5.7.2 Baseline information and survey

Analysis of baseline employment potential under agriculture and that proposed under woodland management.

5.7.3 Assessment of impacts on employment

In FCS's EIA determination letter of 14 September 2011 they requested that the social and economic impact of the proposals on local employment associated with the previous farming enterprise and the social infrastructure of the area must be considered.

In view of this, a comparison of rural employment has been made between the current agricultural baseline and proposed change to woodland. The result of the proposals, in terms of rural employment, is predicted to be positive in relation to the agricultural baseline situation.

The new forestry owner of the farm has currently let some of the ground for cattle grazing. This remains an option should the site be afforested in order to ensure the long-term maintenance of open ground habitats. Further, deer stalking has not been factored into the predicted employment figures as no decision has been taken by the owner on this matter.

Overall a strict comparison of the baseline agriculture employment with the forestry option shows that a net employment gain can be anticipated by the proposed land use change. With an assumed average rotation length (length of time from planting to felling) of 35 years for the first conifer crop at

Carrick (ranging from 30 to 40 years in practise) the following table summarises the baseline employment figures and projected employment resulting from project implementation.

Table 5.7: Employment comparison

Baseline	**Average Man Years over 45 year period**
Sheep 216 ewes	1.2
Mixed Woodland and residual agriculture	
Woodland establishment/management	3.5
Residual agriculture	Not factored in
Deer stalking	Not factored in

Source: The figures for woodland establishment and management have been produced by UPM Tilhill and are included in the Employment Analysis under Other Annexes.

NB Source of figures for agriculture from WEAG Paper on Impact of Woodland Expansion on Farming. Average rough grazing stocking level for Argyll and Bute is 0.14 sheep/hectare. For Carrick, at 1,546 hectares, this equates to 216 sheep. Average number of ewes/farm is 205 average. FTE employment per sheep unit is therefore 1.2.

Afforestation proposals, by their nature, have varying employment requirements throughout the crop rotation. This requirement is relatively high in the first five years which represents the "establishment" phase. This is followed by a quiescent period of growth before thinning begins around year 18. Thinning will normally continue at regular intervals until harvesting and replanting begins around year 30 (or earlier) in the faster growing crops.

The proposed commercial forest area at Carrick will be managed to provide a sustained yield of timber thereby maintaining, in conjunction with other forests in the area, stable employment and a sustainable rural industry. The Argyll and Bute Woodland and Forestry Strategy (2010) notes “forestry is an intergenerational activity that can provide a broad range of economic, environmental and social benefits. It is an important contributor to the economy, providing important jobs in rural areas and thus supporting families and communities across the region”.

The importance of the forestry sector to the economy of Argyll and Bute is shown by the levels of employment it generates. Research undertaken by

FCS in 2008 provides estimates for employment generated by the forestry sector at a national level. Using this information, some *pro rata* estimates for

Argyll and Bute can be made. It is estimated that the forests of Argyll and Bute support (in Argyll and Bute and beyond) 1292 full time equivalent jobs (direct employment).

From a similar *pro rata* estimate the direct Gross Value Added (GVA) of timber from Argyll and Bute is estimated to be approximately £58million. The GVA attributable to visitor spending is estimated to be £26million. The total GVA for Argyll and Bute is estimated at around £1200 million. These figures

further demonstrate the importance of the forestry sector to the economy of Argyll and Bute (source: Woodland and Forestry Strategy).

5.7.4 Predicted impacts

Positive with regard to rural employment.

5.7.5 Mitigation of impacts

None required.

5.7.6 Statement of significance.

Overall, the impact of this project in relation to rural employment is deemed to be positive in the short, medium and long-term and significant.

5.8 Key Issue 6: Timber Haulage

This section should be read in conjunction with the Argyll Timber Haulage Route Map (see Maps) and Technical Annex K.

This section addresses the potential impacts of timber haulage on the local

road infrastructure and local community as required by FCSs EIA determination letter dated 14 September 2011. It includes an assessment of the degree of significance and mitigation measures required.

5.8.1 **Potential Impacts**

- Increase in timber traffic levels particularly at time of harvesting leading to disruption and inconvenience to the local community.
- Damage to fragile road network.
- Potential benefit for public access by creation of timber haulage infrastructure.

5.8.2 **Baseline Information**

- Argyll and Bute Timber Transport Group Agreed Routes Map.
- Consultation with Argyll and Bute Local Roads Services, Argyll and Bute Council.
- Consultation with local community on the 22 May 2012.

5.8.3 **Assessment of impacts**

The Timber Haulage Route Map shows the location of Carrick in relation to the existing forestry plantations in the area and how these are currently served by the existing county road network and the in-forest haul route to the north of Carrick which serves the Forest Enterprise properties to the north.

The roads between Carrick Farm and the A83 are either Consultation or Severely Restricted Routes. The Argyll and Bute Council Roads Department noted at the Screening Meeting on the 29th June 2011 that this has implications when, in circa 30 years' time, timber haulage will become an

issue. Their ideal would be to ensure as much timber haulage as possible takes place within the proposed forest scheme and this to join up with Forest Enterprise's in-forest timber haul route which joins with the A83 and the Rest and be Thankful. For the purposes of timber transport, the A83 is classified as an Agreed Route on the Argyll and Bute Timber Transport Group map.

Access to the proposed woodland development at Carrick is gained from the A83 and then either the B839 (Consultation Route) or B828 (Severely Restricted). From Lochgoilhead to Carrick the C6, a minor public road, is Severely Restricted. This road also provides access to Carrick Wood managed by Scottish Woodlands.

A Severely Restricted Route means it "should not normally be used for timber transport in its current condition. Such routes are considered as being close to Excluded Routes and consultation with the local authority is required to achieve an agreed management regime to avoid land locking timber".

The proposed establishment of new commercial woodland at Carrick extends to circa 450 hectares of productive conifer and should come into production around 2047 yielding approximately 9,900 tonnes of timber per year on average over a 15 to 20 year period. **This is equivalent to about 8 lorry loads of timber per week over 50 weeks. In reality this is more likely to be 4 loads of timber per day 5 days per week for about 20 weeks of the year.**

5.8.4 **Predicted impacts**

Road infrastructure

Although the A83 is already well used by timber traffic the C6 is not used by

heavy traffic other than on a very occasional basis. In its current condition,

the road would very soon deteriorate if it was used on an all year round regular basis by heavy timber traffic.

Consultation with Argyll and Bute Council Roads Services, during the EIA Screening Process, identified the condition of the C6 as being an important issue when the time comes to harvest timber. They indicated that links will be required to existing in-forest timber haul routes.

Although there is some use of the C6 by HGVs traffic (mainly associated with oil/gas deliveries and mobile home movements) this is at a low level. Timber traffic from any harvesting operations on Carrick (and the existing Carrick Forest) would affect residents at Carrick Village and Lochgoilhead but this is unlikely to occur for another 35 to 40 years.

The projected timber production from Carrick is expected to be 9,900 tonnes per annum for fifteen years commencing around 2047 (450 ha @ average 330T per ha). A typical harvesting unit currently produces around 600 tonnes of timber per week and as such an annual harvesting programme would involve 396 trucks (25 tonnes per load) per annum or four wagons per day over 20 weeks. Without mitigation, all of this timber would currently pass through Carrick Village and the outskirts of Lochgoilhead.

5.8.5 Mitigation of Impacts

The Argyll and Bute Woodland and Forestry Strategy (2010) notes "considerable progress in timber transport has been made in Cowal, particularly relating to the expansion of marine transport and the development of the in-forest haul road network. As the area had some of the most productive forests in Argyll and Bute, reinforcing and adding to this capacity will be fundamental in maximising returns from timber crops".

In-forest timber haul route

Currently, Forestry Commission Scotland has existing in-forest road networks and planned forest roads which will come within a few hundred

metres of the Carrick boundary. As well as providing timber from Carrick with a potential route to the A83 at the Rest & Be Thankful, a link to the Forestry Commission woodlands to the north and south of Carrick could provide advantages and options to the Forestry Commission's management of their woodlands linking to possible sea transport at Carrick or linking to Ardentinny and potential sea transport at Sandbank.

FCS is due to submit their draft heads of terms to UPM Tilhill for timber haulage servitudes to the benefit of the Carrick proposed planting.

The existing Scottish Woodlands managed Carrick Wood would also need to be a partner in any in forest haul route links.

The public at Carrick expressed an interest in an in-forest haul route linking to Lochgoilhead with Ardentinny which would bring public access benefits as well.

UPM Tilhill has been actively involved in the construction of a number of in-forest haul routes around Scotland. In Argyll, UPM Tilhill manage the Dunoon Timber Haul Route to avoid the need to haul timber through Dunoon town centre and has recently been awarded a contract to create a timber haul route at Dalmally to divert timber away from fragile roads and the village centre.

Both schemes have involved multiple forest owners and the Forestry Commission in partnership with substantial grants from the Strategic Timber Transport Fund and assisted by the Argyll Timber Transport Group. These routes are essential to alleviate the local timber haulage issues.

Timber transport by sea

The owners of Carrick also own land on the foreshore of Lochgoil at Carrick Village which could be used as a transit point to store timber for onward sea transportation if a suitable pier facility was created. The villagers have expressed a positive interest in this possibility. Such a development would be subject to planning permission. Details of this proposal have been submitted to the National Park Authority and support in principle is being sought. Details of the proposed pier facility are included in Technical Annex K.

Current proposals are for a temporary floating pier to be brought to site when harvesting activity is underway. However, some members of the local community would prefer a permanent structure to which they would also have access.

The Carrick site was investigated as a potential pier site suitable to create a site for a floating pier, by JST Services in October 2010. A rock causeway would be built to facilitate sea haulage using the JST floating pier system, with an area set-aside for timber stacking.

Technical investigations showed that this site was suitable and this would allow the construction of a floating pier with a secure and stable loading platform with a constant freeboard height. Given the depth of water, it is anticipated that vessels with up to a 3,000 tonne capacity could be safely loaded.

The investigations at that time were based on using the pier system to transport 15,000 tonnes of timber from Carrick Wood. The system allows export to a wide range of markets, with the timber purchased free on board (f.o.b) by the purchaser.

Logistics of pier facility.

The estimated stacking space at the proposed loading site is around 1,000 tonnes. When a boat arrives it is loaded by crane from this stock. At the

same time, timber wagons or forwarders would bring in the rest of the timber direct from the forest. A 1,500 tonne vessel (e.g. for export to Ireland) would take one day to load (say 12 hours). 1,000 tonnes would be from the stock-pile, with the balance (500 tonnes) from timber wagons/forwarders direct from the forest.

It is recognised that currently there is significant Ministry of Defence activity in Lochgoil and that their requirements would influence any pier development. However, initial discussions are that, through appropriate consultation, the Ministry of Defence use of the Loch and Sea Transport of timber could co-exist. However, for this woodland creation proposal any decision on a pier development could be 30 years in the future at which time the use of the Loch may be quite different.

UPM Tilhill already successfully use marine transport to ship timber to markets in the UK, Ireland, Scandinavia, and mainland Europe from a number of existing piers such as Sandbank and Ardrishaig. Currently a very similar floating pier development to the one proposed for Carrick is being created at Pennyghael on the Ross of Mull, with Scottish Timber Transport Scheme assistance, to take timber away from the fragile rural roads on the Island and away from having to use existing ferries and existing limited pier facilities in the north of the Island.

Timber transport by public road

The impact of timber transport on public roads can be mitigated by the use of Central Tyre Inflation systems (CTI). Pioneering work was carried out on weak infrastructure in Caithness at Kinbrace. This study has been embraced by Timber Transport Groups and now a significant part of the Scottish timber transport fleet is using CTI.

This is not regarded as a solution in itself to the issues at Carrick but could play a role in a multi-faceted solution. For example, in periods when there are other constraints on haulage such as blockages on the FC haul road. However, this would only be considered as an option after consultation.

5.8.6 **Statement of Significance**

The impact of timber haulage on the infrastructure of the C6 is likely to be adverse without (a) development of in-forest haul routes and (b) creation of a pier to facilitate timber transport by sea. Impacts of timber haulage on the local community relate to increased timber traffic can only be mitigated by implementation of (a) or (b) or a combination thereof. Once implemented there will be no measurable adverse impacts on the road infrastructure or the local community and there are likely to be additional public benefits through improved public access and potential substitution of road haulage of timber for sea transportation.

5.9 Subsidiary Issue 1: Deer management impacts.

This section should be read in conjunction with Technical Annex G. It addresses the potential impacts of excluding deer from Carrick using a deer fenced exclosure. It assesses the degree of significance and any mitigation measures required.

5.9.1 Potential impacts

- Population reduction and displacement of deer from Carrick.
- Potential for increased deer grazing impacts on vegetation outwith Carrick.
- Impeded public access (see Section 5.10).

5.9.2 **Baseline information and survey**

- Site visits by UPM Tilhill Wildlife Manager.
- Liaison with FCS Ranger.
- Liaison with stalking tenant.

5.9.3 **Assessments of impacts**

Deer management is a key landscape scale issue and an important consideration for woodland creation proposals both in relation to woodland establishment and protection. Deer management must reflect the landscape scale of the issue which will require joint working with adjoining land managers particularly FCS who march with Carrick and are currently undertaking deer control to effect establishment of second rotation forests at Cormonachan and Knapp Forests.

This project proposes to establish mixed woodland with the aid of a perimeter deer fence as described in Technical Annex G. While the overall

forest design has been largely informed by landscape and ecological issues it has also been planned with deer management in mind. The exclusion of grazing animals from the site will also have the benefit of allowing restoration of open ground habitats such as upland heath and self-seeding of semi-natural broadleaves.

Common practice would be to consider a compensatory cull when fencing off natural deer range and restricting natural deer movements. A compensatory cull is carried out if there are deer welfare issues at stake or there are adverse impacts on habitats outwith the deer fence or the potential for adverse ecological impacts on surrounding habitats.

Carrick Farm is different from many other proposed planting schemes in as much as there are no conflicting land use issues with adjacent landowners.

Deer numbers in the area are generally low as the three neighbouring forest plantations are all controlled by FCS's own ranger and the objective is to keep deer numbers low in order to establish their woodlands without detrimental deer damage.

Carrick Farm has not and does not carry a resident deer population. There has been some degree of usage by deer moving in and out of the adjacent FCS plantations morning and evenings. Additionally there has often been a small bachelor group of stags on the hill in late summer. Carrick farm has never been a wintering ground for deer as the deer invariably seek shelter in the adjacent unfenced FCS woodlands.

As the adjacent FCS woodlands are now in to second rotation, any loss of feeding areas by fencing Carrick Farm is being compensated for by the better habitat and feeding being created there. Access and deer control facilities are also being improved on the FCS woodlands.

The conclusion therefore is that the cull of 16 Red deer and 5 Roe deer, considering that only a handful of deer was taken every year prior to the change of ownership, together with the increased facility for FCS to cull deer

will constitute any compensatory cull that might have been considered.
It is also concluded that the proposed fencing is not creating any other deer welfare issues.

Any deer that might be trapped during the erection of the fence or during "break ins" at a later stage will be culled either in season or out of season according to the general licence issued by SNH to the occupier of enclosed

woodland.

Deer fencing will be carried out in accordance with FC Guidance Note 11 and "Joint Agency Statement and Guidance on Deer Fencing" – June 2004.

The habitat inside the fenced area will be monitored as part of the on-going forest management operations. The fence line will be monitored on a regular basis and apart from inspecting the general state of the fence, it will also be monitored for any bird strikes as well as signs of any deer pressure on the fence.

Culling at this level, along with necessary monitoring, can only be carried out effectively by professional stalkers and hence UPM Tilhill's full-time wildlife manager will control and supervise these activities. Recreational stalkers will be utilised as the principle control resource.

Once the woodland has been established and beyond browsing damage, deer will use the property and thus help maintain the remaining open ground mosaic of acid and wetland grassland communities.

5.9.4 **Predicted impacts of deer management.**

- Deer numbers will be reduced in the short-term to effect woodland establishment.

- In the medium to long-term woodland will provide shelter for deer and a sporting opportunity for the estate.

- Deer fencing will be marked with droppers where monitoring

  indicates that the fence is a risk to black grouse.

- In the long-term (when the fence is taken down) deer browsing will

limit vegetation growth in some areas and prevent scrub and tree regeneration, maintaining a heterogenous habitat and open hunting ground for golden eagle at Carrick

5.9.5 Mitigation of deer management impacts.

- No mitigation required.

5.9.6 Statement of significance.

The impact of deer management, as proposed, arising from the project is judged to be short to medium-term, beneficial, reversible and significant in nature.

5.10 Subsidiary Issue 2: Public Access

5.10.1 Potential impacts.

- Loss of, or impeded, public access within the estate and to surrounding hills as a result of deer fencing and establishment of closed canopy woodland.

- Loss of viewpoints from the site as a result of woodland establishment.

5.10.2 Baseline information/survey.

- Site visits.

- Core Paths database.

- Liaison with the Loch Lomond and The Trossachs National Park Access Officer.

5.10.3 Assessment of impacts on public access.

This section addresses potential impacts of the project on public access within and beyond Carrick Farm.

Within the National Park Local Plan, Carrick is defined as an area of moderate activity, with some growth potential around the shoreline/coastal strip to an area of low activity on the hill land above to be retained for quiet enjoyment.

To clarify the historic public use of the site, contact was made with the National Park Authority Access Officer. There are no alleged or claimed

rights of way within the project area. The nearest Core Path is the Carrick Castle to Ardentinny path which lies just outside of the eastern boundary of Carrick Farm.

Evidence of historic pedestrian use of Carrick Farm includes access to Lochan nan Cnaimh via the track starting near Cuilimuich and the Carrick Burn towards Sgurr a Choinnich and the adjoining upland. There is a hill path which passes through the Carrick Farm ground beginning at Loch Eck leading via Coire Ealt and Lochan nan Cnaimh and linking with the Cowal Way.

The core path information, and evidence of public access routes across Carrick Farm, is a material consideration in the development of the woodland development proposals. The change of ownership and direction of land management has created an opportunity to encourage responsible public access along existing defined routes and as a result of track creation.

On this basis, the known routes currently used for pedestrian access have formed part of the iterative design process. The access route with the most potential for impact is along the Carrick Glen. Here the existing broadleaves will be reinforced by planting of semi-natural woodland which will improve the visitor experience. Further, there is scope within the proposal to introduce new formal access opportunities, where none currently exist, within the planted area utilizing the new forest track system (see: Maps/Planting Map with roads).

With regard the potential impact of loss of viewpoints from within Carrick Farm it should be noted that the altitudinal planting limit is circa 450 metres OD. This will ensure that the hill tops remain open both as areas of public resort and maintenance of views across Loch Goil and beyond.

Deer fencing of the perimeter of the property has the potential to impede public access. Styles and gates will be incorporated into the fencing design following consultation and agreement with the local community and the National Park Access Officer.

5.10.4 **Predicted impacts on public access.**

- No loss of public access to estate or surrounding hills.
- No loss of views from hill tops.
- Enhanced access opportunities.

5.10.5 **Mitigation of impacts on public access.**

- Ensure provisional core paths are taken into account in the planting design.
- Accommodate access requirements by further consultation with the local community and the National Park Authority Access Officer.

5.10.6 **Statement of significance.**

The impact of this project on public access is deemed to be positive and significant at the local scale.

6. REFERENCES

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7. MAPS

7.1 Location Map
7.2 Concept Map
7.3 Provisional Planting Design
7.4 Aerial Photo
7.5 Argyll Timber Haul Routes
7.6 Public Access

8. TECHNICAL ANNEXES

- Technical Annex A: Archaeological Walk-Over Survey

- Technical Annex B: Landscape and Visual Analysis
- Technical Annex C: Ecology
- Technical Annex D: Habitat Survey
- Technical Annex E: Ecological Site Classification
- Technical Annex F: Breeding Bird Survey
- Technical Annex G: Deer Management Plan
- Technical Annex H: Analysis of critical load exceedance.
- Technical Annex I: Protected species surveys
- Technical Annex J: Golden Eagle (Confidential) Report
- Technical Annex K: Proposed pier facility

9. OTHER ANNEXES

9.1 Screening Meeting Report and other meetings
9.2 Employment Analysis
9.3 Toolbox Talks and other guidance